Estd. 1962
"A++" Accredited by NAAC (2021)
With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR
416 004, MAHARASHTRA
PHONE : EPABX – 2609000, BOS Section – 0231-2609094, 2609487
Web : www.unishivaji.ac.in Email: bos@unishivaji.ac.in
शिवाजी विद्यापीठ, कोल्हापूर ४१६ ००४, महाराष्ट्र
दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४. २६०९४८७
वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in

जा.क्र./शि.वि/अं.म./605 दिनांक:— ०७/१०/२०२५

प्रति,

१. मा. संचालक / प्राचार्य,
सर्व संलग्नीत अभियांत्रीकी महाविद्यालय,
शिवाजी विद्यापीठ, कोल्हापूर

२.संचालक,
स्कुल ऑफ इंजिनिअरींग ॲण्ड टेक्नॉलॉजी,
शिवाजी विद्यापीठ, कोल्हापूर

विषय:— अभ्यासक्रमातील किरकोळ दुरुस्तीबाबत.
संदर्भ:— एसयु/बीओएस/सायन्स&टेक/५३६ दि.०४/०९/२०२५

महोदय,

उपरोक्त संदर्भिय विषयास अनुसररुन आपणास आदेशान्वये कळविण्यात येते की, राष्ट्रीय शैक्षणिक धोरण २०२० नुसार शैक्षणिक वर्ष २०२५—२६ पासून लागू करण्यात आलेल्या खालील अभ्यासक्रमामध्ये किरकोळ दुरुस्ती करण्यात आलेली आहे.

BOS/Adhoc	Course/Syllabus
Food Science & Technology	**B. Sc.** Food Technology & Management (AEDP)
	B. Sc. Food Science (AEDP)

सोबत सदर अभ्यासक्रमाची प्रत जोडली आहे. तसेच विद्यापीठाच्या https://www.unishivaji.ac.in (NEP-2020@suk/ Online syllabus) या संकेस्थळावर ठेवण्यात आला आहे. सदर दुरुस्ती ही शैक्षणिक वर्ष २०२५—२६ पासून लागू राहील.

सदर अभ्यासक्रम सर्व संबधित विद्यार्थी व शिक्षकांच्या निदर्शनास आणून द्यावेत ही विनंती.

कळावे.

आपला विश्वासू,

डॉ. एस. एम. कुबल
उपकुलसचिव
अभ्यास मंडळ विभाग

सोबत — अभ्यासक्रमाची प्रत,
प्रत :— **माहितीसाठी व पुढील योग्यत्या कार्यवाहीसाठी**

मा. संचालक, परीक्षा व मुल्यमापन मंडळ	प्र. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा
अध्यक्ष, **फुड सायन्स ॲण्ड टेक्नॉलॉजी** अस्थायी मंडळ	बी.एस्सी विभागास.
परीक्षक नियुक्ती ए व बी विभागास.	संलग्नता टी. १ व टी. २ विभागास
पीजी प्रवेश विभागास	पीजी सेमिनार विभागास

SHIVAJI UNIVERSITY, KOLHAPUR

Established: 1962

"A^{++}Grade" Accredited by NAAC (2021) with CGPA 3.52

Structure and Syllabus in Accordance with

Apprenticeship Embedded Degree Programme

National Education Policy – 2020

with Multiple Entry and Multiple Exit

Syllabus for

B. Sc. Part – I

Food Science (Entire)

(Faculty of Science and Technology)

Semester I and II

(To be implemented from Academic Year 2025-26)

SYLLABUS OF B.Sc. (FOOD SCIENCE) I (AEDP- NEP 2020)

❖ **Year of Implementation :**To be implemented from June 2025 onwards

- Guidelines shall be as per B.Sc. Regular Program.
- Rules and Regulations in accordance with National Education Policy with effect from Academic Year 2025-26.

❖ Apprenticeship Embedded Degree Programme (AEDP):

Programme enabling a student admitted to an undergraduate programme of the Higher Educational Institution, recognized as per the UGC Act, 1956, to pursue apprenticeship training as an integrated component of the degree programme in compliance with these guidelines. Training in an industry or establishment under a contract of apprenticeship, which consists of a basic training component and on-the-job training (OJT)/ practical training at the workplace? Further, as per the Apprentices Act of 1961, Apprenticeship training means a course of training in any industry or establishment undergone in pursuance of a contract of apprenticeship and under prescribed terms and conditions, which may be different for different categories of apprentices.

❖ **Objectives of AEDP:**

i. To enhance the employability of students pursuing Undergraduate level degree programmes.
ii. To focus on outcome-based learning in all degree programmes to achieve graduate attributes and desired proficiency levels.
iii. To promote active linkage between higher educational institutions and industries/establishments.
iv. To bridge the skill gap in the industries by effectively implementing AEDP in partnership with higher educational institutions and/or Board of Apprenticeship Training (BOAT)/ Board of Practical Training (BOPT).

❖ Preamble:

The Bachelor of Science in Food Science program combines food

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

❖ Program Outcomes:

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

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

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

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

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

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

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

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

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

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

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

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

❖ Objectives of Programme:

1. Understanding Food Science and Processing:

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

2. Ensuring Food Safety and Quality:

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

3. Developing Management and Entrepreneurial Skills:

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

4. Promoting Nutritional Awareness:

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

5. Fostering Industry Relevance and Practical Skills:

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

❖ **Duration of Programme:**

3 years B.Sc. Programme or

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

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

❖ **Medium of instruction:** English

❖ **Eligibility for admission:**

The eligibility of students taking admission at B. Sc. Part-I [Level 4.5] (initial entry) and the eligibility of students making lateral entry (Multiple entry-ME) admission at Level 5.0/Level5.5/Level6.0 are required to be scrutinized(with stipulated procedure) on the basis of following criteria:

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

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

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

OR

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

OR

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

OR

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

(C) Eligibility requirements for admission to B.Sc. Part-III (Level5.5):

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

OR

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

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(Level6.0):

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

OR

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

Eligibility Application requirement:

(a) Students who are seeking admission for Level4.5 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 atLevel5.0,
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 studentwishestoexitaftercompletionofLevel4.5,he / she has to complete additional four credit skill course/ internship.

b) If a student wishes to exit after completion of Level 5.0,he /she has to complete additional four credit skill course/ internship.

c) If a student wishes to exit after completion of Level 5.5, he / she need not require completing any additional skill course/ internship.

❖ **Pattern of B.Sc. Programme:**

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

❖ Credit distribution chart for B.Sc. Programme:

a) For 3 year B.Sc. Programme:

Course Name		**Total Credits**	**% of total 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	**57.58**
Indian Knowledge System	IKS	02	
Community Engagement Programme	CEP	02	
Major Total Credits		**76**	
Minor	MIN	24	18.18
Open Elective(OE)/Generic Elective(GE)Courses	OE	10	7.58
Ability Enhancement Courses	AEC	08	10.60
Indian Knowledge System(Generic)	IKS		
Value Education Courses	VEC		
Skill Enhancement Courses	SEC		6.06%
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	CC		
TOTAL			**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/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	4.55
Co-Curricular Courses(NSS/NCC/Sports/Cultural Activities)	CC	02	
TOTAL		**176**	**100%**

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

Course Name		Total Credits	% of total credits
Major			
Major Mandatory	MM	72	
Major Elective	ME	16	
Vocational Skill Courses	VSC	06	65.91
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	
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 project is applicable and for honours degree, courses related to major are incorporated.

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

❖ **Structure in Accordance with National Education Policy-2020 With Multiple Entry and Multiple Exit Options (AEDP)**

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

Course Code	Teaching Scheme			Examination Scheme					
	Theory and Practical			University Assessment(UA)			Internal Assessment(IA)		
	Lectures + Tutorial/ (Hours/week)	Practical (Hours/ week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
FCI	2	0	2	30	11	1.5	20	7	1
PFPI	2	0	2	30	11	1.5	20	7	1
Lab Course I	0	4	2	30	11	4	20	7	1
FM I	2	0	2	30	11	1.5	20	7	1
HNI	2	0	2	30	11	1.5	20	7	1
Lab Course II	0	4	2	30	11	4	20	7	1
FVP I	2	0	2	30	11	1.5	20	7	1
FAI	2	0	2	30	11	1.5	20	7	1
Lab Course III	0	4	2	30	11	4	20	7	1
OE 1 Will be selected from basket (T)	2	0	2	30	11	1.5	20	7	1
IKS	2	0	2	30	11	1.5	20	7	1
TOTAL			**22**	**330**			**220**		

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

Course Code	Teaching Scheme			Examination Scheme					
	Theory and Practical			University Assessment(UA)			Internal Assessment(IA)		
	Lectures (Hours / week)	Practical (Hours/week)	Credit	Maximum Marks	Minimum Marks	Exam. Hours	Maximum Marks	Minimum Marks	Exam. Hours
FCII	2	0	2	30	11	1.5	20	7	1
PFPII	2	0	2	30	11	1.5	20	7	1
Lab Course IV	0	4	2	30	11	4	20	7	1
FMII	2	0	2	30	11	1.5	20	7	1
HNII	2	0	2	30	11	1.5	20	7	1
Lab Course V	0	4	2	30	11	4	20	7	1
FVPII	2	0	2	30	11	1.5	20	7	1
FAII	2	0	2	30	11	1.5	20	7	1
Lab Course VI	0	4	2	30	11	4	20	7	1
OE-2 Will be selected from basket (T)	2	0	2	30	11	1.5	20	7	1
VEC I	2	0	2	30	11	1.5	20	7	1
TOTAL			**22**	**330**			**220**		
Cum. Total Sem I &II			**44**	**660**			**440**		

- **S#T#–**Subject number Theory paper number
- **S#P#**–Subject number Practical paper number
- **OE#(T)**-Open Elective Theory Paper number
- **OE#(P)**-Open Elective Practical Paper number
- **IKS-1**–Indian Knowledge System Theory Paper1 (Generic)
- **VEC-1**–Value Education Course (Democracy) Theory

- Total Marks for B.Sc.-I :**1100**
- Total Credits for B.Sc.-I (Semester I& II):44
- **Requirement for Exit after Level 4.5:**
- **Award of UG Certificate with 44 Credits and an additional 4 credit score NSQF course/ Internship.**

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

1. The question paper in each semester end examination for each theory course (paper) for B.Sc. (all Semesters) shall be of 30 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	2 Credit Course	Duration
Semester-end Examination	30 Marks	1.5 Hr
Internal Assessment	20 Marks	--
Total marks for each course	50 Marks	--

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

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

Internal Assessment Process shall be as follows:

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

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

Internal Assessment (Theory)

B.Sc. (Food Science) Part I Semester I & II–

1) Home Assignment =05 marks

2) Class Assignment (Tutorial type) =05 marks

3) Quiz =05 marks

4) Unit Test* =05 marks

Note: 1) Unit Test shall be conducted after completion of each unit

*Unit Test Instruction: Unit Test shall be conducted after completion of each unit. (e.g. For 4 units syllabus, unit test of 10 marks will be conducted after completion of each unit).A total of 40 marks of 4 midterm tests shall be converted to 10 marks and these marks shall be uploaded on university exam portal under the heading of unit Test for respective course.

1) **Duration of Examination for 30 marks** **1 Hour**

Duration of Practical Examination for 50 marks **2 Hours**

Internal Assessment for 20 Marks (Practical)

❖ **Continuous Internal Evaluation Pattern for Practical based Courses as follows:**

	40 | 20
1. Assessment of Journal	10 | 5
2. Assessment of Regular Notebook	10 | 5
3. Seminar	10 | 5
4. Test based on	10 | 5

Practical work (Conduct at least two in each semester)

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

❖ **Equivalence of papers and chances for the students in previous-Semester pattern:** Two additional chances in subsequent semesters shall be provided for the repeater students of old three-year B.Sc. program. In such case the scores obtained by the students in NEP 1.0/CBCS scheme should be converted into equivalent credits in 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, she has to take admission for the respective course in NEP 2.0 (AEDP). In such cases his/her previous performance of incomplete academic years (B. Sc. I, B. Sc. II or B. Sc. III) will be cancelled.

❖ **Equivalence of papers: (Old B.Sc. Food Science I & New B.Sc. Food Science I)**

	Old Course	**Equivalent Course**	
Sem No.	**Title of Old Course & Credits**	**Title of New Course& Credits**	**Remark/s**
I	Food Chemistry-I(02)	Food Chemistry-I(02)	No change in syllabus
I	Principles of Food Preservation-I(02)	Principles of Food Preservation-I (02)	No change in syllabus
I	Food Microbiology-I(02)	Food Microbiology-I(02)	Slight modification in syllabus
I	Human Nutrition-I(02)	Human Nutrition -I(02)	No change in syllabus
I	Fruits &Vegetables Processing I (02)	Fruits &Vegetables Processing I (02)	No change in syllabus
I	Food Analysis I(02)	Food Analysis I(02)	No change in syllabus
I	Laboratory Course I(02) Laboratory Course II(02) Laboratory Course III(02)	Laboratory Course I(02) Laboratory Course II(02) Laboratory Course III(02)	Slight changes in syllabus
II	Food Chemistry-II(02)	Food Chemistry-II(02)	No change in syllabus
II	Principles of Food Preservation-II(02)	Principles of Food Preservation-II(02)	No change in syllabus
II	Food Microbiology-II(02)	Food Microbiology-II(02)	No change in syllabus
II	Human Nutrition-II(02)	Human Nutrition -II(02)	No change in syllabus
II	Fruits &Vegetables Processing II(02)	Fruits &Vegetables Processing II(02)	No change in syllabus
II	Food Analysis II(02)	Food Analysis II(02)	No change in syllabus

II	Laboratory Course IV(02) Laboratory Course V(02) Laboratory Course VI(02)	Laboratory Course IV(02) Laboratory Course V(02) Laboratory Course VI(02)	Slight changes in syllabus

Apprenticeship Embedded Degree Programme

Bachelor of Food Science (B.Sc. Food Science)-Course Structure (As per AEDP)

Credit Framework

SHIVAJIUNIVERSITY,KOLHAPUR

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

First Year

SEM (Level)	COURSES			OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP /CC/RP	Total Credits	Degree/Comic. MEME
	Course-1	Course-2	Course-3						
SEM I (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 Nutrition I (2) DSCP-I Lab Course II (Based on DSC I & II) (2)	DSC-I Fruits& Vegetables Processing I(2) DSC-II Food Analysis I (2) DSCP-I Lab Course III(Based on DSC I & II) (2)	OE- 1 Will be selected from OE Basket(2) (T)	-	IKS-I Introduction to IKS (2)	-	22	UG Certificate 44
SEM II (4.5)	DSC-III Food Chemistry II (2) DSC-IV Principles of Food Preservation II (2) DSCP-II Lab Course IV (Based on DSC III & IV) (2)	DSC-III Food Microbiology II(2)DSC-IV Human Nutrition II (2) DSCP-II Lab Course V (Based on DSC III & IV) (2)	DSC-III Fruits & Vegetables Processing II(2) DSC-IV Food Analysis II (2) DSCP-II Lab Course VI (Based on DSC III&IV)(2)	OE-2 Will be selected from OE Basket (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)**	**--**	**2+2=4**	**--**	**44**	**Exit option: 4 Credits NSQF/Internship/ Skill Courses**

Second Year

	MAJOR		MINOR	OE	VSC/SEC	AEC/VEC/IKS	OJT/FP/CEP /CC/RP	Total Credits	Degree/Comic. MEME
SEMIII (5.0)	Major V Cereals& Bakery Products Processing I (2) Major VI Food Biochemistry (2) Major P III Lab Course VII(Based on Major V &VI)(2)	-	Minor V Dairy Technology(2) Minor VI Meat Fish & Poultry Products Processing(2) Minor P III Lab Course VIII (Based on Minor V & VI) (2)	OE-3 Will be selected from OE Basket (2) (T)	VSC I Lab Course IX Vocational Skill Course in Jam, Jelly &Ketchup Processing (2) (P) (Major specific) SEC I Design & Development of New Product(2) (T)	AECI(2) (English)	CC-I(2)	**22**	**UG Diploma 88**
SEMIV (5.0)	Major VII Cereals& Bakery Products Processing II (2) Major VIII Sugar & Confectionary Processing(2) Major P IV Lab Course X (Based on Major VII & VIII) (2)	-	Minor VII Snack Food Processing (2) Minor VIII Food Packaging (2) Minor P IV Lab Course XI (Based on Minor VII & VIII)(2)	OE-4 Will be selected from OE Basket (2) (T)	SEC-II Lab Course XII 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(P/T)+2(P)=6**	**2+4=6**	**2+2=4**	**44**	**Exit option: 4 Credits NSQF/Internship/ Skill Courses**

Third Year

	Major		Minor	OE	VSC/SEC	AEC/VEC/IKS	AEDP	Total credits	Degree/Comi c. MEME
SEM V (5.5)	Major IX Food Safety Management System I(2)Major X Legume & Oilseed Processing(2) Major P V Lab Course XIII(Based on Major IX & X) (4)	Major I (ELEC)Food Additives/ Food Refrigeration (2) Major P-I (ELEC)Lab Course XIV (Based on Major I ELEC)(2)	-	OE-5 Will be selected from OE Basket (2)(T)	VSCII(2) (Major specific) Lab Course XV Vocational Skill Course in Bakery Processing (P)	AECIII(4) (English) IKS (2)	-	**22**	**UG Degree 132**
SEM VI (5.5)	–				SEC III Entrepreneurship Skills for Food Technologist (2)(T)		Apprenticeship (6 months) (20)	**22**	
Credits	**4(T)+4(P)=08**	**2(T)+2(P)=4**	**-**	**2(T/P)**	**2(P)+2(T)=4**	**4+2=6**	**20**	**44**	
Total Credits	**40+20=60**		**24**	**10**	**12**	**16**	**10**	**132**	**Exit Option**

❖ **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	30	20	50
Minimum Marks required for passing	11	7	18

1. There shall be a separate head of passing for semester end examination and internal examination.
2. Minimum18 marks out of 50 are required for passing of practical examination of each course.
3. Passing criteria for Co-Curricular Activities (CC),Field Project (FP),On Job Training (OJT),Community Engagement Program (CEP) and Research Project (RP) as per the University guidelines.

❖ **Gradation Chart:**

% of Marks Obtained	**Numerical Grade (Grade Point)**		**Letter Grade**
Absent	--		-
0–34	0		F(Fail)
35–44	5		C
45–54	6		B
55–64	7		B+
65–74	8		A
75–84	9		A+
85–100	10		O(Outstanding)

Note:

Marks obtained >=0.5 shall be rounded off to next higher natural number.

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

❖ **Calculation of SGPA & CGPA:**

1.Semester Grade Point Average**(SGPA)**

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

2.Cumulative Grade Point Average**(CGPA)**

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

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

❖ **Rules for 60:40 Evaluation Pattern**

❖ **Nature of question paper and scheme of marking:**

a) Theory (Semester exam) for each Theory paper: Maximum marks–30

Modality of Assessment

Students appearing for the NEP (AEDP) B.Sc. I will be evaluated as per the 60:40 schemes where in the term end exam will be of 30 marks each paper while 20 marks will be through internal evaluation for each paper.

A. Theory Examination

- ✓ Equal weight age shall be given to all units of the theory paper
- ✓ Total number of questions– 03
- ✓ Question one will carry- 10 Marks,
- ✓ QuestionNo.1will be of an objective type eight objective will carry- 10 Marks.
- ✓ Question 2 will be descriptive one questions are to be attempted out of two and will carry 10 Marks)
- ✓ Question 3 will be short answer type two questions are to be attempted out of three and will carry 10 Marks, 05 Marks each)
- ✓ **Nature of questions**-multiple choice, Descriptive and short answer type.
- ✓ All these questions will be answered in the same answer book

Semester End Theory Assessment 30 marks

- The duration of this exam will be of 1and half Hrs (90 minutes)
- For each unit there will be at least one question
- All questions shall be compulsory with internal choice with in the questions

Nature of question paper

Total Marks: 30 **Time: 1 and half Hrs (90minutes)**

Instructions:

1. All questions are compulsory.
2. Figures to the **RIGHT** indicate **FULL MARKS.**

Q.1 Multiple choice questions (10 -Questions) 10 marks

a)

a)

:

:

j)

Q.2 Attempt any **ONE** of the following.

(Essay type/ Broad answer questions) 10 marks

a)

b)

Q.3 Attempt any **TWO** of the following 10 marks

a)

b)

B.InternalAssessment40%

Level	Semester	Activities Per Semester	4 credits	2 credits
4.5 (First year)	I &II	1 Home Assignment	10 marks	5 marks
		2Class Assignment(Tutorial type)	10 marks	5 marks
		3 Quiz	10 marks	5 marks
		4Unit Test *	10 marks	5 marks
5.0 (Second Year)	III & IV	1 Oral Examination	10 marks	5 marks
		2GroupDiscussion	10 marks	5 marks
		3 Seminar	10 marks	5 marks
		4 Unit Test*	10 marks	5 marks
5.5 (Third Year)	V &VI	1CaseStudy/Problem solving	10 marks	5 marks
		2Field Work / Seminar	10 marks	5 marks
		3BookReview/ Poster Presentation	10 marks	5 marks
		4 Unit Test*	10 marks	5 marks
6.0 (Fourth Year)	VII& VIII	1 Seminar	10 marks	5 marks
		2CaseStudy/Problem Solving	10 marks	5 marks
		3Book Review/ Poster Presentation	10 marks	5 marks
		4 Unit Test*	10 marks	5 marks

Note:

1. For two credit course, unit test of 10 marks shall be conducted and it is converted into5 marks.
2. For four credit course, unit test of 10 marks shall be conducted.
3. Book Review (Any relevant Reference Book)

PRACTICAL EXAMINATION

- There will be semester wise practical examination to be conducted at the end of each semester. The question paper along with marking scheme and skeleton / Question paper will be given by BOS before practical examination.
- Total marks-50 for each semester-I and II(Will be evaluated by two Internal examiner.)
- Total-50 Marks for each Sem -III and IV(Major,Minor,VSC and CEP courses Will be evaluated by one Internal examiner and one external examiner OE,SEC,CC courses will be evaluated by two Internal examiner.)
- Total- 50 Marks(2 credit course) for each Sem -V and VI(Will be evaluated by two external examiner)
- Total-100 Marks(4 credit course)for each Sem -V and VI (Will be evaluated by two external examiner)
- External examiners are provided by University. Internal examiners are from respective college fulltime regular faculty. If fulltime regular faculty is not available in college, then principal of the college shall invite internal examiner from fulltime regular faculty appointed in nearby college.

❖ 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 Annexure1.

R.B.Sc.No.3

List of Courses:

B.Sc. I	**Sem I**	• Subject I:DSC I,DSC II, and Practical I • Subject II: DSC I,DSC II, and Practical I • Subject III:DSC I, DSC II, and Practical I • OEI(Theory/Practical) • IKSI(Introduction to IKS)
	Sem- II	• Subject I:DSC III, DSC IV, and Practical II • Subject II:DSC III, DSC IV, and Practical II • Subject III:DSCIII,DSC IV, and Practical II • OE II(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 • AEC I(English) • CC
	Sem IV	• Major VII,VIII, and Major Practical IV • Minor VII,VIII, and Minor Practical IV • OEIV(Theory/Practical) • SEC II 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 • OE V(Theory/Practical) • VSC II Practical II Major Specific • AEC III(English) • OJT
B.Sc. III	**Sem VI**	• Major XI, XII, and Major Practical VII,VIII • Major II (Elective),Major((Elective)Practical-II • VSC III Practical Major Specific • SEC III Practical • AEC IV(English) • IKS II(Major Specific) • FP

R.B.Sc.No.4

(A) Skill Enhancement Course(SEC):

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

(B) **Open Elective Course (OE):** Open Elective **Course should be selected from the basket provided by University.** This course is to be chosen compulsorily from faculty other than that of major or Geography or Mathematics or Statistics from OE basket.

(C) **Co-curricular Courses (CC):** For Semester III one Co-curricular course such as Health and Wellness/Yoga education / sports and fitness /Cultural Activities/NSS/NCC/Fine Arts/Applied Arts/Visual Arts / Performing Arts is to be chosen compulsorily. The student should be engaged for four hours per week. The examination pattern will be decided by the respective bodies.

(D) On Job Training (OJT):

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

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

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

R.B.Sc.No.5

The student must earn at least 60% of the credits from his/her mother institute.Thestudentsmayearnatthemost40%ofthecreditsinanyhead, 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 maybe 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 maybe 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:

1. If a student fails in up to four courses (of two credits each) of passing of the University examination (Theory/Practical) and has passed in all the remaining heads, the marks obtained by him / her in the Physical Education Test shall be added to maximum upto four courses (of two credits each) for passing in which he has failed as the case may be.
2. A student getting the benefit of Physical Education marks should notbe given advantage of any other Ordinance. The Physical Education Marks

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

3. If as a result of the addition of Physical Education marks a student does not pass the examination the marks obtained by him / her in Physical Education shall not be considered.
4. If a student is failing in more than four courses (of two credits each) the marks of the physical education test should not be added to any head.
5. The marks of Physical Education obtained by the unsuccessful students at the B.Sc. Part-I semester Examination shall be carried forward for their subsequent attempt/s.
6. The marks obtained in Physical Education shall not be considered for earning exemption in a subject of head of passing, but the marks willbe 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 new course (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, need store appear for B.Sc. Part II (Sem II 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 11 marks out of 30 for the semester end theory examination, 18 out of 50 for the semester end practical examination and 7 marks out of 20 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, AECOE, 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-Ito 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 l 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 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

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–I

DSC I Food Chemistry I

Credits: 2

Semester End 30 Internal Assessment:20 Total:50

COURSE OUTCOME

CO1Students will get introduced to Food chemistry and nutrition concept
CO2Explain properties & reactions of carbohydrates, lipids and proteins during storage and processing of food.
CO3Explain the importance of water for stability and quality of foods
CO4 Give an overview of the main classes of compounds influencing colour and flavor of food and have knowledge on important sources of vitamins and minerals in food and how These affect other quality aspects of food

Unit No	Content	No of Hours
1	Definition and Introduction to food chemistry **Water** Water and forms of water Role of water in food Water activity and storage of food **Carbohydrates** Definition and Classification Structure and Sources Physical and chemical properties	15
2	**Proteins** Definition and Classification Structure and Sources Physical and chemical properties **Lipids** Definition and Classification Structure and Sources Physical and chemical properties	15

Suggested Reading:

1. Birch, G. G.,Cameron,A.G.andSpencer,M.FoodScience,3rdEd.Pergamon Press, New York.

2. Fennema,O. R.Ed. Principles of Food Science: Part-I

3. Marcel Dekker, Food Chemistry.NewYork.

4. Meyer,L.H.Food Chemistry. East-West Press Pvt. Ltd., New Delhi..

5. Potter,N.N.FoodScience.3rd Ed.AVI, West pors

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–I

DSC II Principles of Food Preservation I

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1They will understand importance of preservatives different methods and its importance.
CO2 Explain the basic principles of food preservation processes: heating, chilling, freezing, control of water activity, acidification, chemical preservatives, packaging, etc.
CO3Explain the range of processing operations used for food preservation including thermal processing, chilling and freezing, dehydration, irradiation, non thermal methods, etc
CO4Explaineffects of processing and storage conditions on shelf life of foods

Unit No	Content	No of Hours
1	**Fundamentals of Food Preservation** Introduction &Definition of Food Preservation Importance & Need of Food Preservation Principles of Food Preservation Techniques of Food Preservation **Food Spoilage** Definition and Introduction to Food Spoilage Types and Causes of Food Spoilage Physico-chemical changes in Food due to Spoilage Microbial Spoilage of Food-Yeast, Moulds and Bacteria Enzymatic spoilage of food Food spoilage by intrinsic &extrinsic Factors	15
2	**Food Preservation by High Temperature** Concept &Importance Definition& Principle Effect of heat on microorganisms Thermal death time Factors affecting heat resistance Methods-Boiling, Blanching, Pasteurization, Sterilization, UHT & Canning Effect of high temperature on food Advantages & Disadvantages **Food Preservation by Low temperature** Concept & History Definition &Principle Effect of cold temperature on microorganisms Methods of low temperature Preservation-Cellar storage, Refrigeration or Chilling & Freezing Effecton food Advantages & Disadvantages	15

Suggested Reading:

1. Arsdel W.B., Copley, M.J. and Morgen,A.I. Food Dehydration, 2nd Edn.(2vol.Set).AVI, Westport.

2.Bender, A. E. Food Processing and Nutrition. Academic Press, London.

3.Fellows,P. and Ellis H.Food Processing Technology: Principles and Practice, New York.

4. G. Subbulakshmi, Shobha A Udipi (2001) Food Processing and Preservation, New Age International (P) Limited Publication

5. P.J. Fellow (2005) Food Processing Technology, Wood head Publication Pvt Ltd.

6. Virag Gupta Food Safety & Standards Act 2006, Rules 2011, Regulations (2021), Commercial Law Publication (India) Pvt Ltd.

7. Norman Desrosier Technology of Food processing (1987), CBS publication & distribution.

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–I

DSC I Food Microbiology I

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1Students will understand the basic concepts in microbiology, principle and working of different instruments used in lab along with its application.
CO2They will get the knowledge about the how bacteria grows, different factors which affect their growth, different requirements for bacterial growth, different isolation and purification methods used for bacteria
CO3They will understand the principle and importance of different staining methods used for bacteria.
CO4 They will gain knowledge on different sources, types of bacteria that cause spoilage in food, various changes that occur during spoilage in food depending on their nutrient content.

Unit No	Content	No of Hours
1	**Introduction to Microbiology** Concept of General Microbiology Morphological characteristics of Bacteria, Yeasts and Molds Physical and chemical factors affecting growth of microorganisms Morphology of bacteria: Size, Shape and Arrangements Cytology of bacteria-structure of typical bacterial cell, structure and functions of: cell wall Growth and Growth curve of bacteria. **Techniques in microbiology** Sterilization-Physical methods- Temperature, Filtration, UV radiation and Osmotic pressure Chemical methods-Use of chemical agents for sterilization	15
2	**Definition of Media** Components of Media Types of media: Natural, Synthetic, Semi-synthetic, Special, Selective and Differential media Cultural methods- Isolation techniques: Streak plate, pour plate and Spread plate. **Stains and Staining Procedures of Bacteria** Definition of dye and stains, classification of stains-Acidic, Basic and Neutral Staining procedures: Principles and Procedure Mechanism and applications of- Simple staining, Differential staining-Gram staining and Acid fast stains. Mechanism and applications of Negative staining, Special staining	15

Suggested Reading:

1. FoodMicrobiology.3rdEdn.VNR,New York.Robinson,R.K.Ed. 1983.

2. Dairy Microbiology. Applied Science,London.

3. BranenA.L.andDavidson,P.M.AntimicrobialsinFoods.MarcelDekker,NewYork

4. Michael Pelczar.Jr.,E.C.S. Chan, Noel R. Krieg (1996) Microbiology, Tata Mac Graw Hill Publishing Company Limited, New Delhi.

5. S.S. Purohit (2001) Microbiology Fundamentals and Applications 6 th Edition, Agrobios.

6. B.D. Singh (2006), Biotechnology, Kalyani Publishers.

7. Dr. M.G. Bodhankar, Mrs. Tripti Bapat, Mrs. N.S. Joshi (2003), Phadke Prakashan.

8. R.C. Dubey, A Textbook of Biotechnology, S.Chand Publication.

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–I

DSC II Human Nutrition I

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1They will acquire knowledge about basics of nutrition, balanced diet, vitamins and minerals-
CO2Educate others about holistic Nutrition, lifestyle, wellness and healthy living Familiarize nutritional assessment, RDA and Recommendations & Guidelines
CO3Gain knowledge on changes during various stages of growth and development throughout life cycle
CO4Understand the basic principles of diet and diet therapy, acquire the knowledge of modifications of normal diet for therapeutic purposes.

Unit No	Content	No of Hours
1	**Introduction to Nutrition** Definitions and History Nutrition research in India **Menu Planning and Balance Diet** Food Pyramid and Food Groups Nutritional and Food Requirements of Adults Nutritional Requirements Food Requirements **Nutritional and Food Requirements for Infants** Food Requirements for Low Birth Weight and Preterm Baby Weaning foods . Nutritional and Food Requirements for Preschool	15
2	**Nutritional and Food Requirements for Preschool Children** Nutritional Requirements Factors affecting Nutritional Status Food Requirements Nutrition Related Problems of Preschoolers Feeding Programmes **Nutritional and Food Requirements for and School Children** Nutritional Requirements Factors affecting Nutritional Status Food Requirements School Lunch Programmes	15

Suggested Reading:

1. B. Srilakshmi(2007)Dietetics, Revised Fifth Edition, New Age International Publishers

2. B. Srilakshmi(2011) Nutrition Science,Third Edition, New Age International Publishers

3. Dr. M. Swaminathan (2006) Advanced Text book on Food and Nutrition, Volume 1 and 2 Second Edition, BAPPCO Publication.

4. Mahan L. K., Escott- Stump, S. and Raymond J. L. (2012): "Krause's Food and the Nutrition Care Process", 13th Edition, Elsevier.

5. Ross, A.C., Caballero B., Cousins R. J., Tucker K.L. and Ziegler T. (2014) Modern Nutrition in Health and Disease. Wolters Kluwer Health / Lippincott Williams and Wilkins. Ed 11th

6. Garrow, J. S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics. 10th Edition, Churchill Livingstone. 7. Nix Staci (2013) William's Basic Nutrition and Diet Therapy. Elsevier Ed.14th

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–I

DSC I Fruits and Vegetables Processing I

Credits: 2

Semester End 30 Internal Assessment :20 Total:50

COURSEOUTCOME

CO1To be come familiar with the fundamentals of fruit and vegetable processing
CO2 Describe the spoiled fruits and vegetables and give the cause, taking safety precautions as necessary
CO3To get a fundamental understanding of the processes used to process fruits and vegetables
CO4To evaluate the students produce in each lab and to put the methods and techniques of fruit and vegetable processing into practice

Unit No	Content	No of Hours
1	**Introduction** Introduction to Fruits Classification and composition of fruits Climacteric and non- climacteric fruits Current status of production and processing of fruits and vegetables. Post-harvest physiology, handling, losses and conservation of Fruits and Vegetables	15
2	**Processing Technology of fruits** Technology of Jams, Jellies marmalade, Glazed fruits, Crystallized fruits, fruits candy, fruit preserve **Technology of beverage** Juices and pulps, RTS, concentrates squashes, cordials, nectars, Carbonated beverages. Some Other Valuable Products from Fruits	15

Suggested Reading:

1) Fruit &vegetable preservation, Principles and Practices-R P Shrivastav & SanjeevKumar

2) Preservation of fruits and vegetables-GirdhariLal &T D Tandon

3) Principles of Fruit Preservation–T.N.Morris

4) Hand book of fruit science and technology-Salunkhe D. K, Kadam S.S.

5) Preservation of fruit and vegetables-Bhatiya Vijaya

6) Fruits: Tropical &Sub tropical-T K Bose, S K Mitra, D Sanyal
7) Modern Technology of Tomato Processing & Dehydration–EIRI Board of Consulants & Engineers
8) Food preservation Techniques–Atul Agnihotri
9) Fruit &Vegetable preservation–N.P.Singh
10) Fruit &Vegetable Preservation Techniques–R. K. Narang

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SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–I

DSC II Food Analysis I

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1 Understand the principles of food analysis by conducting various analytical techniques; learn various physical, chemical and biochemical analyses of foods
CO2To understand how to validate a method to monitor microbiological and/or chemical hazards in food
CO3They will gain knowledge about panel members, their selection, types and tasks to implement a sampling plan to monitor chemical and microbiological hazards in food.
CO4They will acquire knowledge about sensory attributes, facilities for sensory evaluation

Sensory evaluation methods of food.

Unit No	Content	No of Hours
1	**Introduction** Objectives of Food Analysis Quality attributes of food Sampling of Food Types of samples Methods of food sampling	15
2	Proximate analysis of Food: moisture, protein, fat, fibre, ash and carbohydrate **Sensory Evaluation and Texture Analysis** Principles of sensory evaluation Types of sensory evaluation Descriptive analysis and consumer testing Texture profile analysis(TPA)and rheological measurements	15

Suggested Readings:

1. Aurand, L.W.and Woods,A.E. Food Chemistry. AVI Westport.

2. Birch,G.G.,Cameron,A.G.andSpencer,M.FoodScience,3rdEd.PergamonPress,New York.

3. Fennema,O.R. Ed. Principles of Food Science: Part-IFood Chemistry.

4. S. Suzanne Nielsen .Food Analysis–Google Book edited.)–[Chapter16,20,21,22].

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–I

OE I Open Elective

Credits: 2

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

SHIVAJI UNIVERSITY,KOLHAPUR
Syllabus as per National Education Policy (NEP) 2020
B.Sc. Food Science
SEMESTER–I
IKS I Indian Knowledge System
Credits: 2
Syllabus will be as per regular B. Sc. Structure.

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP) 2020 B.Sc. Food Science SEMESTER–I Lab Course I (Based on DSC I & II) Credits: 2	
1	Determination of moisture content in food
2	Estimation of protein
3	Natural acidity of milk
4	Pectin strength of different fruits extract
5	Study of different equipment's
6	Blanching of vegetables
7	Aonla pickle
8	Food preservation by sugar
9	Browning effect of fruits and vegetables
10	Canning of fruits and vegetables

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP) 2020 B.Sc. Food Science SEMESTER–I Lab Course II (Based on DSC I & II) Credits: 2	
1	Study of compound microscope
2	Study of lab equipment's
3	Study of components used for culture media
4	Peptone water
5	Preparation of general purpose media
6	Calculation of BMR and body surface area
7	Calculation of energy value of food
8	Preparation of balance diet
9	Planning of Calcium rich dish
10	Role of various national and international agencies in field of human nutrition

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy (NEP) 2020 B.Sc. Food Science SEMESTER–I Lab Course III (Based on DSC I & II) Credits: 2	
1	Study of lab equipment's
2	Preparation of fruits jam
3	Preparation of fruit jelly
4	Preparation of RTS and squash
5	Preparation of jam marmalades
6	Determination of moisture content
7	Determination of fat by soxhlet method
8	Determination of gluten content

SHIVAJI UNIVERSITY,KOLHAPUR
Syllabus as per National Education Policy (NEP) 2020
B.Sc. Food Science
SEMESTER–II
DSC III Food Chemistry II
Credits: 2
Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1Students will get introduced to Food chemistry and nutrition concept
CO2Explain properties & reactions of carbohydrates, lipids and proteins during storage and processing of food.
CO3Explain the importance of water for stability and quality of foods
CO4 Give an overview of the main classes of compounds influencing colour and flavor of food and have knowledge on important sources of vitamins and minerals in food and how these affect other quality aspects of food

Unit No	Content	No of Hours
1	**Minerals** Definition and Types of minerals Sources R D A and Deficiency **Food Pigments** Introduction Classification Characteristics Industrial applications of colors/pigments in food processing	15
2	**Vitamins** Definition and Types of vitamins Sources RDA and deficiency **Food flavors** Introduction Classification Characteristics Industrial applications of flavors in food processing	15

Suggested Reading:

1. Birch,G.G.,Cameron,A.G.andSpencer,M.FoodScience,3rdEd.PergamonPress,New York.

2. Fennema,O. R.Ed. Principles of Food Science: Part-I

3. Marcel Dekker,Food Chemistry.New York.

4. Meyer,L. H. Food Chemistry.East-West Press Pvt. Ltd., New Delhi..

5. Potter,N.N.FoodScience.3rdEd.AVI,Westpor

6. Sukhneet Suri and Anita Malhotra (2014), Food Science, Nutrition and Safety, Dorling Kindersley (India) Pvt. Ltd, Pearson.

7. Sunetra Roday (2018), Food Science and Nutrition, 3rd Edition, Oxford University Press, New Delhi

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–II

DSC IV Principles of Food Preservation II

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSE OUTCOME

CO1They will understand importance of preservatives different methods and its importance.
CO2 Explain the basic principles of food preservation processes: heating, chilling, freezing, control of water activity, acidification, chemical preservatives, packaging, etc.
CO3Explain the range of processing operations used for food preservation including thermal processing, chilling and freezing, dehydration, irradiation, non thermal methods, etc
CO4Explain effects of processing and storage conditions on shelf life of foods

Unit No	Content	No of Hours
1	**Food Preservation by Drying/Dehydration** Concept &Definition Underlying Principle Factors affecting rate of drying Pretreatments to food before drying Natural drying- Sun Drying Artificial Dehydration methods or Types of Dryers Theory, Applications & Advantages Changes in food due to dehydration Rehydration or Reconstitution Food Preservation by Irradiation **Recent/Non-destructive methods of Food Preservation** Introduction Methods-Theory, Equipment& Applications	15
2	Dielectric heating Ohmic heating Infrared heating Pulsed electric field processing High pressure processing Ultrasound heating Hurdle technology Advantages &Disadvantages	15

Suggested Reading:

1. Arsdel W.B.,Copley, M .J.andMorgen,A.I.FoodDehydration,2ndEdn.(2vol.Set).AVI, Westport.
2. Bender, A.E. Food Processing and Nutrition. Academic Press, London.
3. Fellows, P.and Ellis H. Food Processing Technology: Principles and Practice, New York.
4. P.J.Fellow (2005) Food Processing Technology, Wood head Publication Pvt Ltd.
5. Virag Gupta Food Safety & Standards Act 2006, Rules 2011, Regulations (2021), Commerical Law Publication (India) Pvt Ltd.
6. Norman Desrosier Technology of Food processing (1987), CBS publication & distribution

SHIVAJIUNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–II

DSC III Food Microbiology II

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1Students will understand the basic concepts in microbiology, principle and working of different instruments used in lab along with its application.
CO2They will get the knowledge about the how bacteria grows, different factors which affect their growth, different requirements for bacterial growth, different isolation and purification methods used for bacteria
CO3They will understand the principle and importance of different staining methods used for bacteria.
CO4 They will gain knowledge on different sources, types of bacteria that cause spoilage in food, various changes that occur during spoilage in food depending on their nutrient content.

Unit No	Content	No of Hours
1	**Microbiology and Spoilage of food** Factors influencing food spoilage– Intrinsic &Extrinsic factors Contamination and spoilage of fruits and vegetables Contamination and Spoilage of cereal-cereal products Contamination and Spoilage of meat, fish, poultry Contamination and Spoilage of milk- milk products **Microbiology of water** Bacterial flora of water Indicators of faecal pollution and their advantages Bacteriological determination of water- Standard plate count, Total plate count Qualitative test-Standard multiple tube fermentation& IMVIC test Quantitative test-Most probable number test.	15
2	**Food-Borne illness**: Bacterial and Non-bacterial Food Borne Intoxications–Staphylococcal poisoning, Botulism Food Borne Infections–Salmonellosis, Shigellosis Food Borne Toxic Infections–Cholera, Listeriosis Mycotoxins – Aflatoxin, Patulin, Ochratoxin Food–Borne Parasites –Trichinosis Seafood Toxicants–Shell fish Poisoning, Scombroid Food Poisoning Food **Fermentations** Role of micro-organisms in fermentation Fermented Meat & Fish Products– Sausages, Fermented Fish Fermented Fruit &Vegetable Products–Sauerkraut, Kimchi, Vinegar, Citric acid	15

	Fermented Cereal Products– Idli, Vada, Dosa, Bhatura, Dhokla, Miso, Tempeh, Soy Sauce Economically important fermented foods- Beer, Ale, Wine, Distilled Liquor Products	

Suggested Reading:

1. Food Microbiology.3rdEdn.VNR,NewYork.Robinson,R.K.Ed. 1983.

2. Dairy Microbiology. Applied Science, London.

3. Branen A. L.and Davidson,P.M.Antimicrobials in Foods.Marcel Dekker, New York

4. L. E. Casida Jr. (2019), Industrial Microbiology 2 nd Edition, New Age International Publishers.

5. M. R. Adams, M.O. Moss (2015), Food Microbiology, New Age International Publishers.

6. James M. Jay (1987), Modern Food Microbiology, CBS Publishers and Distributors.

7. Dey S. (1994), Outlines of Dairy Technology. Oxford Univ. Press. New Delhi, 1994.

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy (NEP) 2020

B.Sc. Food Science

SEMESTER–II

DSC IV Human Nutrition II

Credits: 2

Semester End 30 Internal Assessment: 20 Total:50

COURSEOUTCOME

CO1They will acquire knowledge about basics of nutrition, balanced diet ,vitamins and minerals-
CO2Educate others about holistic Nutrition, lifestyle, wellness and healthy living Familiarize nutritional assessment, RDA and Recommendations & Guidelines
CO3 Gain knowledge on changes during various stages of growth and development through out life cycle
CO4 Understand the basic principles of diet and diet therapy, acquire the knowledge of modifications of normal diet for therapeutic purposes.

Unit No	Content	No of Hours
1	**Nutritional and Food Requirements during Adolescence** Nutritional Requirements Food Habits **Nutritional Problems Nutritional and Food Requirements for Expectant Mothers** Physiological Changes Pre conceptual Nutrition Nutritional Requirements Food Requirements General Dietary Problems Complications Indian Pregnant Women	15
2	**Nutritional and Food Requirements for Lactating Women** Role of Hormones in Milk Production Nutritional Requirements Food Requirements Indian Nursing Mothers **Nutritional and Food Requirements during Old Age** Process of Ageing Nutritional Requirements Food Requirements Nutritional Related Problems of old age Degenerative Diseases Exercise and Old Age Drugs and Old Age	15

Suggested Reading:

1. B.Srilakshmi(2007) Dietetics, Revised Fifth Edition, New Age International Publishers

2. B.Srilakshmi(2011) Nutrition Science, Third Edition, New Age International Publishers

3. Dr. M. Swaminathan (2006) Advanced Text book on Food and Nutrition, Volume 1 and 2 Second Edition, BAPPCO Publication.

4. Mahan L. K., Escott- Stump, S. and Raymond J. L. (2012): "Krause's Food and the Nutrition Care Process", 13th Edition, Elsevier.

5. Ross, A.C., Caballero B., Cousins R. J., Tucker K.L. and Ziegler T. (2014) Modern Nutrition in Health and Disease. Wolters Kluwer Health / Lippincott Williams and Wilkins. Ed 11th

6. Garrow, J. S., James, W.P.T. and Ralph, A. (2000): Human Nutrition and Dietetics. 10th Edition, Churchill Livingstone. 7. Nix Staci (2013) William's Basic Nutrition and Diet Therapy. Elsevier Ed.14th

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–II

DSC III Fruits and Vegetables Processing II

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1To become familiar with the fundamentals of fruit and vegetable processing
CO2 Describe the spoiled fruits and vegetables and give the cause, taking safety precautions as necessary
CO3To get a fundamental understanding of the processes used to process fruits and vegetables
CO4 To evaluate the student's produce in each lab and to put the methods and techniques of fruit and vegetable processing into practice.

Unit No	Content	No of Hours
1	**Introduction** Introduction to vegetables Classification and composition of vegetables Climacteric and non- climacteric vegetables Current status of production and processing of vegetables. Post-harvest physiology, handling, losses and conservation of Vegetables	15
2	Vegetable Processing Tomato Juice, Puree Tomato Processing Chutneys–Processing& Tomato Sauce/Ketchup–Specifications Tomato Soup & Tomato Chilli Sauce Processing of French Fries(Frozen Potato Chips) Processing of Potato Chips/Wafers Potato Processing–Important Considerations Some Other Valuable Products Vegetables	15

Suggested Reading:

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

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–II

DSC IV Food Analysis II

Credits: 2

Semester End 30 Internal Assessment : 20 Total:50

COURSEOUTCOME

CO1 Understand the principles of food analysis by conducting various analytical techniques; learn various physical, chemical and biochemical analyses of foods
CO2To understand how to validate a method to monitor microbiological and/or chemical hazards in food
CO3They will gain knowledge about panel members, their selection ,types and tasks to implement a sampling plan to monitor chemical and microbiological hazards in food.
CO4 They will acquire knowledge about sensory attributes, facilities for sensory evaluation sensory evaluation methods of food.

Unit No	Content	No of Hours
1	**Microbiological Analysis** Enumeration of microorganisms (total plate count) Detection of specific pathogens (Salmonella, E. coli) Analysis of food borne toxins(mycotoxins, bacterial toxins)	15
2	**Instrumental Techniques in Food Analysis** Liquid Chromatography Gas Chromatography HPLC GCMS NMR	15

Suggested Readings:

1. Aurand, L.W.and Woods,A.E.Food Chemistry.AVI, Westport.

2. Birch,G.G.,Cameron,A.G.andSpencer,M.FoodScience,3rdEd.PergamonPress,New York.

3. Fennema,O.R. Ed. Principles of Food Science: Part-I Food Chemistry.

4. S. Suzanne Nielsen. Food Analysis–Google Book edited.)–[Chapter16,20,21,22]

SHIVAJI UNIVERSITY,KOLHAPUR

Syllabus as per National Education Policy(NEP)2020

B.Sc. Food Science

SEMESTER–II

OE II Open Elective

Credits: 2

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

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SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy(NEP)2020 B.Sc. Food Science SEMESTER–II Lab Course IV(Based on DSC III & IV) Credits: 2	
1	Acid value of fats and oils
2	Effect of sugar on boiling point of water
3	Smoke point of fats and oils
4	Effect of browning of fruits and vegetables
5	Estimation of gluten content
6	Study of dryers
7	Preparation of RTS
8	Food preservation by use of Food preservative.

SHIVAJI UNIVERSITY,KOLHAPUR Syllabus as per National Education Policy(NEP)2020 B.Sc. Food Science SEMESTER–II Lab Course V(Based on Minor III &IV) Credits: 2	
1	Preparation of selective and differential media
2	Preparation of culture medium for yeast, mould and fungi
3	Isolation of microorganisms from air
4	Isolation of microorganisms from soil
5	Study of skin micro flora
6	Nutritional labeling of food products
7	Diet for specific health condition
8	Planning of protein rich diet
9	Planning of mid-day meal for pre-school children
10	To plan low cost recipe for lactating women

SHIVAJI UNIVERSITY,KOLHAPUR
Syllabus as per National Education Policy(NEP)2020
B.Sc. Food Science
SEMESTER–I
Lab Course VI (Based on DSC III & IV)
Credits: 2

1	Preparation of tomato soup
2	Preparation of tomato chutney
3	Preparation of tomato sauce/ ketchup
4	Processing of potato
5	Preparation of Anola pickle
6	Determination of alcoholic acidity
7	Estimation of crude fiber
8	Determination of ash content