

SU/BOS/Science/498

Date: 10/07/2023

To,

The Principal, All Concerned Affiliated Colleges/Institutions Shivaji University, Kolhapur	The Head/Co-ordinator/Director All Concerned Department (Science) Shivaji University, Kolhapur.
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Subject: Regarding syllabi of B.Sc. Part-II (Sem. III & IV) as per NEP-2020 degree programme under the Faculty of Science and Technology.

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 revised syllabi, nature of question paper and equivalence of B.Sc. Part-II (Sem. III & IV) as per NEP-2020 degree programme under the Faculty of Science and Technology.


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

This syllabus, nature of question and equivalence shall be implemented from the academic year 2023-2024 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2023 & March/April 2024. 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,


Dy Registrar
Dr. S. M. Kubal

Copy to:

1	The Dean, Faculty of Science & Technology	8	P.G. Admission/Seminar Section
2	Director, Board of Examinations and Evaluation	9	Computer Centre/ Eligibility Section
3	The Chairman, Respective Board of Studies	10	Affiliation Section (U.G.) (P.G.)
4	B.Sc. Exam/ Appointment Section	11	Centre for Distance Education

SHIVAJI UNIVERSITY, KOLHAPUR.



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WITH MULTIPLE ENTER MULTIPAL

EXIT OPTIONS AS PER NEP

2023

B.Sc. Part - II Food Science & Quality Control

(To be implemented from Academic Year 2023
onwards.)

Proposed scheme for Choice based Credit System with multiple enter multipal exit options B.Sc.Food Science & Quality Control

SEMESTER-III (Duration-6 Months)																		
Sr. No.	Course (Subject) Title	TEACHING SCHEME						EXAMINATION SCHEME										
		THEORY			PRACTICAL			THEORY					PRACTICAL					
		Credits	No. of	Hours	Credits	No. of	Hours	Internal			University							
								Max Marks	Min		Hours	Max Marks	Total	Min	Hours	Max Marks	Min Marks	
1	DSC-C Food science -V	2	3	2.4	4	8	6.4	4		2	40	80	28	PRACTICAL EXAMINATIONIS ANNUAL				
2	DSC-C Food science- VI	2	3	2.4				4		2	40							
3	DSC-C Botany-V	2	3	2.4	4	8	6.4	4		2	40	80	28					
4	DSC-C Botany-VI	2	3	2.4				4		2	40							
5	DSC-C Zoology- V	2	3	2.4	4	8	6.4	4		2	40	80	28					
6	DSC-C Zoology- VI	2	3	2.4				4		2	40							
7	AECC-C Env Studies	4	4	3.2	---	---	---	---		---	---	---	---					
8	SEC-III	Any one from pool of courses			2	---	---	---			---	---	---	---	2	50	18	
	TOTAL	16	22	17.6	14	24	19.2				240	350	---		50			

SEMESTER-IV(Duration-6 Months)																	
Sr. No.	Course (Subject) Title	TEACHING SCHEME						EXAMINATION SCHEME									
		THEORY				PRACTICAL			THEORY				PRACTICAL				
		Credits	No. of lecture	Hours		Credits	No. of lecture	Hours	Internal			University			Hours	Max Marks	Min Marks
									Max Marks	Min Marks		Hours	Max Marks	Total			
1	DSC-C Food Science-VII	2	3	2.4	4	6.4	8	10	4		2	40	80	28	As per BOS Guide-lines	100	35
2	DSC-C Food Science-VIII	2	3	2.4				10	4		2	40					
3	DSC-C Botany-VII	2	3	2.4	4	6.4	8	10	4		2	40	80	28		100	35
4	DSC-C Botany-VIII	2	3	2.4				10	4		2	40					
5	DSC-C Zoology-VII	2	3	2.4	4	6.4	8	10	4		2	40	80	28		100	35
6	DSC-C Zoology-VIII	2	3	2.4				10	4		2	40					
7	AECC-C AECC-D Env. Studies	---	---	---	---	---	---	---	---		3	70	100	25		---	---
											Project	30		10			
8	SEC-IV	Any one from pool of courses			2	---	---								2	50	18
	TOTAL	12	18	14.4	14	19.2	24						400	---		350	
		28	40	32	28	38.4	48						750	--	---		
• Student contact hours per week: 36.8 Hours (Min.)							• Total Marks for B.Sc.-II (Including EVS) 1100										
• Theory and Practical Lectures :48 Minutes Each							• Total Credits for B.Sc.-II (Semester III & IV): 56										
• DSC: -Discipline Specific Core Course: Select any 3subject pairs, relevant to those opted at B. Sc. I, from DSC C1 to DSC C38 and / or DSC IC39 to DSC IC50 and DSC D1to DSC D38 and/or DSC ID39 to DSC ID50.																	
• AECC- Ability Enhancement Compulsory Course (C): Environmental Studies: EVS Theory and AECC-D EVS Project (Theory:70 & Project:30 marks)																	
• There shall be separate passing for internal and University theory as well as practical / project examinations.																	

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| <ul style="list-style-type: none">• <i>Practical Examination shall be conducted annually for 100 Marks per course (subject) and minimum 35 marks are required for passing.</i> |
| <ul style="list-style-type: none">• <i>Except Environmental Studies, there shall be combined passing for two theory papers of 40 marks each. i. e. minimum. 28 marks are required for passing out of 80.</i>• <i>Minimum 4 marks are required for passing out of 10 for Internal Examination of each paper.</i>• <i>Examination of SEC shall be either theory or practical depending upon type of SEC.</i> |

B.Sc. with Food Science & Quality Control - Scheme of examination.

Semester	Course opted	Course Name	Credits
	DSC-33A	Food preservation - V	2
	DSC-34A	Fruits and Vegetable Processing - VI	2
	Core Course Practical/Tutorial	Practical's	2
	DSC-33B	Quality Control of food products -VII	2
	DSC-34B	Cereals & Pulses Technology - VIII	2
	Core Course Practical/Tutorial	Practicals	2

B.Sc. Food Science & Quality Control

Core papers Food Science & Quality Control .Credit: 2(T)+2(T)+2(P)

1. DSC-33A Food preservation – V (02)
- 2.DSC-34A Fruits and Vegetable Processing - VI (02)
- 3.DSC-33B Quality Control of food products -VII (02)
- 4.DSC-34B Cereals & Pulses Technology - VIII (02)

B.Sc. II Food Science and Quality Control
Semester III
Paper V - Food preservation
(2Credits)

Unit 1: Introduction of preservation **(8)**

- 1.1 Introduction of preservation
- 1.2 General principles of preservation
- 1.3 Class I & Class II preservatives
- 1.4 Need and benefits of industrial food preservation

Unit2: Food preservation by high and low temperature **(13)**

- 2.1 Methods of high temperature Preservation
 - A) Blanching B) Pasteurization c) Canning
- 2.2 Effect of heat on food & microorganisms
- 2.3 Methods of low temperature preservation
 - A) Chilling B) Refrigeration C) Freezing
- 2.4 Effect of low temperature on food & microorganisms

Unit 3: Food preservation by drying **(8)**

- 3.1 Types of drying
- 3.2 Changes during Drying
- 3.3 Effect of drying on food
- 3.4 Advantages & Disadvantages

Unit 4: Food preservation by Irradiation **(9)**

- 4.1 Introduction & units of irradiation
- 4.2 Mechanism of action of radiation
- 4.3 Radiation process
- 4.4 Effect of radiation on food & microorganisms

Semester III

Paper VI Fruits and Vegetable Processing (2Credits)

Unit 1: Introduction of fruits and Vegetables	07
1.1 Definition of ripening	
1.2 Changes occurring during ripening	
1.3 Textural changes	
1.4 Regulation of ripening	
Unit 2: Jams jellies and marmalade	12
2.1 definitions of jam jellies and marmalade	
2.2 Methods of preparation.	
2.3 Role of ingredients	
2.4 FPO specifications and preservation	
Unit 3: Tomato products	13
3.1 Introduction	
3.2 Preparation of tomato juice, soup	
3.3 Preparation of tomato puree, ketchup	
3.4 preservation	
Unit 4: Fruit and vegetable beverages	07
4.1Types of beverages	
4.2 preparations of squashes, syrup, cordials, RTS	
4.4 preservation	

Semester IV
Paper VII Quality Control of food products
(2Credits)

Unit 1. Sensory evaluation of food **12**

1.1 Different aspect aspects of sensory science & evaluation with their application

1.2 Sensory assessment of food quality

a) Appearance b) Color c) Flavors d) Texture

1.3 Reasons for testing food quality

1.4 Types of sensory tests

a) Different test b) Sensitivity test c) Rating test d) Descriptive test

Unit 2 Objective evaluation of food **12**

2.1 Definition, Advantage & Disadvantage of evaluation.

2.2 Tests used for objective evaluation

a) Chemical methods

b) Microscopic Experiments

c) Physico-chemical method

d) Physical method

2.3 Measurement of colour

2.4 Measurement of texture

Unit 3 Colorimeter & Spectrophotometer **07**

3.1 Principle & working of Colorimeter

3.2 Applications

3.3 Principle & working of spectrophotometer

3.4 Applications

Unit 4 Flurimeter & Chromatography **07**

4.1 Principle working & application of Flurimeter

4.2 Types of Chromatography & their principle & working

4.3 Application of each Chromatography method

Semester IV
Paper VIII Cereals & Pulses Technology
(2Credits)

Unit 1. Introduction of Cereals & Pulses	07
1.1 Introduction	
1.2 Important cereals & pulses	
1.3 Morphologic al Characters of cereals and pulses	
1.4 Storage & handling	
Unit 2. Cerels technology	12
2.1 Composition and nutritive value	
2.2 Specific cerels and milling operation	
a) Wheat b) Rice C) Corn	
2.3 Effect of Heat on Cereals	
4.4 Role of cereals in cookery	
2.5 Breakfast cereals	
Unit 3 Pulses Technology	13
3.1 Nutritive value of pulses	
3.2 Pulses processing	
3.3 Role of pulses in cooking	
3.4 Effect of cooking on pulses	
3.5 Toxic constituents	
3.6 Factors affecting cooking quality of pulses	
Unit 4 Oil seed technology	07
4.1Introduction	
4.2 Methods of oil extraction	
a) Rending	
b) Mechanical press	
c) Solvent extraction	

Recommended Books

1. Food Science by B. Srilakshmi, 2010
2. Food Microbiology by Frazier, 2009
3. Food Processing and Preservation by B. Shivshankar

Nature of theory Examination and distribution of marks Common Nature of Question Paper as Per Faculty of Science.

Practical Course (4 Credits)

List of Practical- Practical I

- 1) Preparation of pineapple jam
- 2) Preparation of apple jam
- 3) Preparation of jelly
- 4) Preparation of marmalade
- 5) Preparation of amala candy
- 6) Preparation of pickles
- 7) Preparation of orange squash
- 8) Preparation soymilk
- 9) Preparation of flavored soya milk
- 10) Preparation of cake
- 11) Preparation of wheat halawa
- 12) Preparation of potato chips
- 13) Study of cutout examination of canned food
- 14) Determination of iodine value of oil
- 15) Isolation of casein from milk
- 16) Determination of titratable acidity and pH of milk
- 17) Isolation of Staphylococcus species from food sample
- 18) Isolation of Salmonella species from food sample
- 19) Isolation of halophilic bacteria from food sample
- 20) Screening and isolation of amylase producing microorganisms

Practical II

- 21) Extraction of gluten content from wheat flour
- 22) Extraction of fat by soxhlet method
- 23) Estimation of ash content of food sample
- 24) Estimation of total sugar by phenol H₂SO₄
- 25) Estimation of reducing sugar by DNSA method
- 26) Estimation of vita min C by DCPIP method
- 27) Determination of saponification value of oil
- 28) Estimation of fructose by resorcinol method
- 29) Determination of an acid value of oil
- 30) Study of food preservation by low temperature
- 31) Estimation of starch by anthron method
- 32) Isolation of starch from potato
- 33) Study of paper chromatography
- 34) Study of physicochemical method of quality evaluation of food

- 35) Study of microscopic experiments of evaluation of food quality
- 36) Determination of pH value of various food samples
- 37) Estimation of protein by biuret method
- 38) Visit to rice milling industry
- 39) Visit to oil processing industry
- 40) Visit to fruit processing industry

Practical examination of 100 Marks –

1. The practical examination will be conducted on two days for Not less than five hours on each day of practical examination.
2. Each candidate must produce a certificate from the head of The department in his / her college stating that he / she has Completed practical course in satisfactory manner on the lines Laid down from time to time by A.C. on the recommendation of BOS and that laboratory journal has been properly maintain.
3. Candidate has to visit at list two places of interest (food Industry/ Dairy/research lab) and submit the report of their visit at The time of the examination. The report duly certified by head of The department.

Distribution of marks for practical examination –

Practical I

Spotting.	10 marks
Preparation of product.	20 marks
Preparation of product.	20 marks

Practical II

Estimation of chemical components	15 marks
Determination of chemical component	15 marks
Journal	10 marks
Tour report	10 marks

Total	100 marks
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