


 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 विभाग २३१-२६०९०९३/९४	
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SU/BOS/Science/

No 00195 Date: 12 SEP 2022

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

Subject :- Regarding syllabi of B.Sc., (NEP-2020) adegree programme under the Faculty of Science and Technology as per National Education Policy, 2020 .

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 and Nature of question paper of **B.Sc., (NEP-2020)** under the Faculty of Science and Technology as per **National Education Policy, 2020 .**

Sr. No.	Faculty of Science and Technology	Programme/ Course
1	Food Science & Technology	B. Sc. Part- I Food Technology and Management (Entire)
		B. Sc. Part- I Food Science & Quality Control
		B. Sc. Part- I Food Science (Entire)

This syllabi and nature of question paper shall be implemented from the Academic Year 2022-2023 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website www.unishivaji.ac.in (students Online Syllabus)

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

Thanking you,

Yours faithfully,

Dy Registrar

Copy to:

1	The Dean, Faculty of Science & Technology	7	Appointment Section
2	Director, Board of Examinations and Evaluation	8	P.G.Seminar Section
3	The Chairman, Respective Board of Studies	9	Computer Centre (I.T.)
4	B.Sc. Exam	10	Affiliation Section (U.G.)
5	Eligibility Section	11	Affiliation Section (P.G.)
6	O.E. I Section	12	P.G.Admission Section

SHIVAJI UNIVERSITY, KOLHAPUR.



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CHOICE BASED CREDIT SYSTEM

WITH MULTIPLE ENTER MULTIPAL

EXIT OPTIONS

Syllabus For

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

SEMESTER I AND II

(Syllabus to be implemented from June, 2022 onwards.)

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

	SUBJECT NAME	Credits		SEC	
SEM.1	FOOD SCIENCE & QUALITY CONTROL -1	06	TOTAL 24	SEC (1) VB (1)	TOTAL 30
	FOOD SCIENCE & QUALITY CONTROL -2				
	BOTANY 1	06			
	BOTANY 2				
	ZOOLOGY 1	06			
	ZOOLOGY 2				
	CHEMISTRY 1	06			
	CHEMISTRY2				
	ENGLISH	04			

	SUBJECT NAME	Credits		SEC	
SEM.2	FOOD SCIENCE & QUALITY CONTROL -3	06	TOTAL 24	SEC 2	TOTAL 30
	FOOD SCIENCE & QUALITY CONTROL -4				
	BOTANY 1	06			
	BOTANY 2				
	ZOOLOGY 1	06			
	ZOOLOGY 2				
	CHEMISTRY3	06			
	CHEMISTRY4				
	ENGLISH	04			

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

Semester	Course opted	Course Name	Credits
I	Ability Enhancement Compulsory Course-1	(English/ MIL Communication)/ Environmental Science	2
	DSC-33A	Food Chemistry-I	2
	DSC-34A	Food Microbiology-I	2
	Core Course Practical/Tutorial	Practicals	2
II	Ability Enhancement Compulsory Course-2	(English/ MIL Communication)/ Environmental Science	2
	DSC-33B	Food chemistry-II	2
	DSC-34B	Food Microbiology -II	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 Chemistry-I (02)
- 2.DSC-34A Food Microbiology-I (02)
- 3.DSC-33B Food chemistry-II (02)
- 4.DSC-34B Food Microbiology-II (02)

Semester I

DSC-33A: Food Chemistry-I

(2 Credits Theory)

Theory 60 lectures

Theory

Objectives

- To understand the chemistry of foods-composition of food, role of each component and their interaction.
- To understand the functional aspects of food components and to study their role in food processing.

Contents

Unit 1. Introduction to Food Chemistry (5 lecture)

- Definition
- Composition of food
- Basics of carbohydrates and its importance.
- Lipids
- Protein
- Mineral & Vitamins

Unit 2 Water (8 Lectures)

- Definition of water in food
- Structure of water
- Types of water
- Water activity & shelf life.

Unit 3 Lipids (9 lectures)

- Classification of lipid
- Physical property- melting point, softening point, specific gravity, refractive index
- Chemical properties-Iodine value, peroxide value, saponification value
- Effect of frying on fats
- Changes in fats & oil- Rancidity, Lipolysis, Flavour reversion.
- Auto-oxidation & its prevention.
- Technology of edible fats & oil- Refining, hydrogenation & interesterification

Unit 4 Protein (7 lectures)

- Protein classification & structure
- Nature of food protein (plants& animal Protein)
- Properties of protein(Electrophoresis, Denaturation)
- Functional properties solubility, gelation, emulsification, foaming.

DSC-34A: Food Microbiology-I (2Credits)

Theory

Objective:

- To know importance genera of microorganisms associated with food & their characteristics
- To understand the role of microbes in fermentation , spoilage & food born diseases

Contents

Unit 1: Introduction to Food Microbiology (5 Lectures)

- History & development of food microbiology
- Definition & scope of microbiology
- Importance of microbiology in food

Unit 2: Characteristics of microorganisms in food (8 Lectures)

- Types of microorganisms associated with food
- Morphology & structure of microorganisms
- Factors affecting the growth of microorganisms

Unit 3: Culture media & staining techniques (7 lectures)

- Common Components of media & their functions
- Types of media- living, nonliving
- Classification of stains- acidic, basic & neutral
- Staining procedure-Simple, negative, Gram & differential.

Unit 4: Microbial food spoilage (8 Lectures)

- Source of microorganisms in food
- Important food spoilage microorganisms.
- Spoilage of specific food groups-milk & dairy products, meat, poultry & sea food,
- cereal & cereal products,
- fruits & vegetable
- Canned products.

Practical's (2Credits)

Contents:

1. Preparation of primary solutions
2. Determination of pH of fruit juice samples
3. Determination of hardness of water
4. Estimation of moisture content
5. Isolation of starch from potato
6. Isolation of Casein from milk.
7. Determination of gelatinization temperature range (GTR) of different starches.
8. Introduction to microbiological instruments.
9. Study of compound microscope. 10. Cleaning & sterilization of glass wares
11. Preparation & sterilization of Nutrient broth.
12. Cultivation & sub-culturing of microbes.
13. Preparation of slant, plates using nutrient agar
14. Morphological study of bacteria & fungi using permanent slides.

Recommended books:

1. Fennema, Owen R, Food chemistry, 3rd edition Marcell Dekker, New York 1996
2. DeMan, J.M., Principle of food chemistry AVI, New York, 1980
3. Potter, N.N. & Hotchkiss, J.H., Food Science, 5th, Chapman & Hall, 1995
4. H. Thapar, Food Chemistry 1st edition Pacific books international 2011
5. Frazier William C & Westoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004.
6. Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
7. Pelczar MJ, Chan E.C.S & Krieg, Noel R. microbiology, 5th Edition, TMH, New Delhi 1993
8. S. Jadhav, Textbook of microbiology, 2nd edition, Mehta publications pune, 2000

Semester II

DSC-33B: Food Chemistry-II (2 Credits Theory)

Theory 60 lectures

Theory

Unit 1 Carbohydrates (5 lectures)

- Classification of Carbohydrates
- Structures of important polysaccharides
- Chemical reaction of Carbohydrates-oxidation, reduction, with acid & alkali.
- Modified Cellulose & Starches

Unit 2 Vitamins (8 lectures)

- Definition & classification
- Structure, importance & stability
- Water soluble vitamins & their sources
- Fat soluble vitamins & their sources

Unit 3 Minerals (7 Lectures)

- Definition
- Classification of minerals
- Sources & deficiency of minerals
- Toxic minerals.

Unit 4 Flavour (8 Lecture)

- Definition & basic tastes
 - Chemical structure & taste
 - Description of food flavor
- Flavor Enhance

SEMESTER .1

SR.NO	COURSE (SUBJECT) TITLE	TEACHING SCHEME					
		THEORY			Practical		
		Credits	No. of lectures	Hours	Credits	No. of Lectures	Hours
1	FOOD SCIENCE & QUALITY CONTROL -1	2	05	04	02	04	03
2	FOOD SCIENCE & QUALITY CONTROL -2	2					
3	BOTANY 1	2	05	04	02	04	03
4	BOTANY 2	2					
5	ZOOLOGY 1	2	05	04	02	04	03
6	ZOOLOGY 2	2					
7	CHEMISTRY1	2	05	04	02	04	03
8	CHEMISTRY2	2					
9	ENGLISH	2	04	03
TOTAL		18	24	19	08	16	12

SEMESTER.2

SR.NO	COURSE (SUBJECT) TITLE	TEACHING SCHEME					
		THEORY			Practical		
		Credits	No. of lectures	Hours	Credits	No. of Lectures	Hours
1	FOOD SCIENCE & QUALITY CONTROL -3	2	05	04	02	04	03
2	FOOD SCIENCE & QUALITY CONTROL -4	2					
3	BOTANY 3	2	05	04	02	04	03
4	BOTANY 4	2					
5	ZOOLOGY 3	2	05	04	02	04	03
6	ZOOLOGY 4	2					
7	CHEMISTRY 3	2	05	04	02	04	03
8	CHEMISTRY4	2					
9	ENGLISH	2	04	03
TOTAL		18	24	19	08	16	12

B: Food Microbiology-II
DSE34(2Credits)

Theory

Unit 1: Food born disease (8Lectures)

- Definition
- Food born infection
- Food born intoxication
- Prevention of food born diseases

Unit 2: Cultivation of microorganisms (7 Lecture)

- Pure Culture techniques
- Method of isolation & cultivation
- Enumeration of microorganisms- Qualitative & Quantitative

Unit 3: Control of microorganisms in food (8 Lecture)

- Principle & method of preservation
- Physical method of food preservation- High temperature & low temperature.
- Biopreservatives esp. Bacteriocin

Unit 4: Food Fermentation (5Lectures)

- Definition
- Microorganisms used in food fermentation.
- Fermented foods.

Practicals (2Credits)

1. Determination of percentage of free fatty acid.
2. Estimation of Saponification value
3. Estimation of reducing sugar by DNSA method.
4. Estimation of protein by Biuret method.
5. Estimation of vitamin C by DCPIP method.
6. Estimation of total Ash content.
7. Determination of boiling point of water.
8. Simple staining
9. Gram's staining
10. Standard plate count method.
11. Preparation of curd.
12. Preparation of idli.
13. Identification of spoiled food samples.
14. Microbial sampling of air- indoor & outdoor

Recommended books:

1. Syed Iqbal & N. Labal, Advanced Food Chemistry 1st edition, New Delhi, 2011
2. Dr. P. Shrivastva & Dr. A. Swarup Food Chemistry, 1st edition, New Delhi, 2014
3. N. Shakuntala Manay & M. Shadaksharaswamy, Foods Facts & Principles, 3rd edition
New Delhi, 2008
4. Sunetra Roday, Food Science & Nutrition, New Delhi, 2009
5. K. Buggal, Introduction to Food microbiology, 1st edition, Cyber tech publication, 2011
6. Dr. Sharath C. Patil & Dr. Naidu, Food Microbiology, 1st edition Campus book
publication, 2010
7. Dr. P. Shrivastva & Dr. A. Swarup Food & Microorganisms, 1st edition, New Delhi, 2014