SHIVAJI UNIVERSITY, KOLHAPUR.

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Accredited By NAAC with 'A' Grade

CHOICE BASED CREDIT SYSTEM

Syllabus For

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

SEMESTER I AND II

(Syllabus to be implemented from June, 2018 onwards.)

Proposed scheme for Choice based Credit System B.Sc. with Food Science & Quality Control

Sem	Core Course (12)	Ability Enhancement Compulsory Course(AECC)(2)	Skill Enhancement Course(SEC)(2)	Discipline Specific Elective (DSE)(6)
I	Food Chemistry-I	(English/ MIL Communication)/ Environmental Science		
	Food Microbiology- I			
	DSC-A			
	DSC-A			
	DSC-A			
II	Food Chemistry-II	(English/ MIL Communication)/ Environmental Science	SEC-1	
	Food Microbiology- II			
	DSC-B			
	DSC-B		SEC-2	
	DSC-B			

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 CoursePractical/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 CoursePractical/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 (1lecture)

- Definition
- Composition of food

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 (10 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 (7 Lectures)

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

Unit 3: Culture media & staining techniques (8 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 (8Lectures)

- 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.

Practicals (2Credits)

Contents:

1. Prepartion 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 Chemisrty 1st edition Pacific books international 2011

5.Frazier William C & Westhoff , Dennis C. Food Microbiology, TMH, New Delhi, 2004.

6.Jay,James M. Modern Food Microbiology,CBS Publication, New Delhi,2000

7.PelczarMJ, Chan E.C.S & Krieg, Noel R. microbiology,5th Edition, TMH,New Delhi 1993

8 .S. Jadhav, Textbook of microbiology, 2nd edition, Mehta ublications pune,2000

Semester II

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

Theory 60 lectures

Theory

Unit 1Carbohydrates(9lectures)

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

Unit 2Vitamins (7 lectures)

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

Unit 3 Minerals (6Lectures)

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

Unit 4 Flavour (6Lecture)

- Definition & basic tastes
- Chemical structure & taste
- Description of food flavour
- Flavour Enhancer

DSC-34B: Food Microbiology-II
(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