Anekant Education Society's

TULJARAM CHATURCHAND COLLEGE, BARAMATI, DIST-PUNE – 413102

Revised Proposed Syllabus

For

B. Voc.

(Food Processing & Post Harvest Technology)

F.Y. (Semester II)

(Autonomous)

Sponsored by

University Grant Commission

Under

National Skill Qualification Framework (NSQF)

To be implemented from

2022-23

Title of the Course: B. Voc. (Food Processing & Post Harvest Technology)
(To be implemented from Academic Year - 2022-2023)

Course structure:

- B. Voc. is three year degree programme with three theory and three practical courses in each semester**.**
- Each theory course will be of four credits and each credit is of 15 periods
- Each practical course will be of six credits and each credit is of 15 periods
- Each period is of one clock hour.
- In each practical course, there will be one visit to the relevant industry/ institute.
- In addition to the regular practicals based on the theory course, special emphasis will be on communications and soft skills development of the students.

Eligibility:

1) **First Year B.Voc. (Diploma):** A student who has passed the Higher Secondary School Certificate (10+2) in any stream or its equivalent examination
2) **Second Year B.Voc. (Advanced diploma):** Keeping terms of First Year of B. Voc. and if they fulfill the eligibility conditions.
3) **Third Year B.Voc. (Degree):** Student shall pass all First Year B. Voc. courses and satisfactorily keeping terms of Second Year of B. Voc.

Note: Admissions will be given as per the selection procedure / policies adopted by the college, in accordance with conditions laid down by the Savitribai Phule Pune University, Pune.

Examination Pattern:

Examination:

- **Pattern of Examination**.
  i) Internal exam, Term end exam, Oral, Project, Presentation, GD, Viva voce
  ii) Pattern of the question paper:
    i) 25% Objective Question
    ii) 50% Short and Long Answer type question
    iii) 25% Problem based Case Study/long answer type
- **Theory Examination: -**
  i) Continuous Internal Assessment: 50 Marks (Unit Test I & II, Assignment-2No., Attendance) for each course of programme.
  ii) Semester End Examination: 50 Marks on the basis of Answer Sheet Evaluation for each course
- **Practical Examination: -**
  i) Continuous Internal Assessment: 75 Marks (Written exams, Visit Report, Journal, Viva Voce, Seminar/Presentation, Group Discussion and Attendance) for each course.
  ii) Semester End Examination: 75 Marks on the basis of Answer Sheet Evaluation with performance in practical examination which will be evaluated by external examiner for each course.

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DIST-Pune-413102

First Year: Semester-I

Subj. Code	Subject Name	No. of Credits	Marks
Theory (General Component)			
UBFP111	Principles of Food Preservation	4	100
UBFP112	Food Microbiology - I	4	100
UBFP113	Food Science - I	4	100
Practical (Skill Component)			
UBFP1111	Principles of Food Preservation	6	150
UBFP1112	Computer Application	6	150
UBFP1113	Food Science-I	6	150

First Year: Semester-II

Subj. Code	Subject Name	No. of Credits	Marks
Theory (General Component)			
UBFP121	Nutrition Science	4	100
UBFP122	Food Microbiology-II	4	100
UBFP123	Food Science - II	4	100
Practical (Skill Component)			
UBFP1211	Nutrition Science	6	150
UBFP1212	Food Microbiology-II	6	150
UBFP1213	Soft Skill Development	6	150

Second Year: Semester-III

Subj. Code	Subject Name	No. of Credits	Marks
Theory (General Component)			
UBFP231	Processing of Fruits, Vegetables & Plantation Crops	4	100
UBFP232	Processing of Cereals, Pulses & Oilseeds	4	100
UBFP233	Food Chemistry-I	4	100
Practical (Skill Component)			
UBFP2311	Processing of Fruits, Vegetables & Plantation crops	6	150
UBFP2312	Processing of Cereals, Pulses & Oilseeds	6	150
UBFP2313	Food Chemistry-I	6	150

Second Year: Semester-IV

Subj. Code	Subject Name	No. of Credits	Marks
Theory (General Component)			
UBFP241	Bakery and Confectionery Technology	4	100
UBFP242	Food Chemistry-II	4	100
UBFP243	Food Analytical Techniques	4	100

Practical (Skill Component)			
UBFP2411	Bakery and Confectionary Technology	6	150
UBFP2412	Food Chemistry-II	6	150
UBFP2413	Fundamentals in Bio-Statistics	6	150

Third Year: Semester-V

Subj. Code	**Subject Name**	**No. of Credits**	**Marks**
Theory (General Component)			
UBFP351	Dairy Technology	4	100
UBFP352	Food Quality, Laws and Regulations	4	100
UBFP353	Principle of Post-Harvest Technology	4	100
Practical (Skill Component)			
UBFP3511	Dairy Technology	6	150
UBFP3512	Entrepreneurship Development	6	150
UBFP3513	Project	6	150

Third Year: Semester-VI

Subj. Code	**Subject Name**	**No. of Credits**	**Marks**
Theory (General Component)			
UBFP361	Animal Product Technology	4	100
UBFP362	Packaging Technology	4	100
UBFP363	Food Safety, Hygiene and Sanitation	4	100
Practical (Skill Component)			
UBFP3611	Animal Product Technology	6	150
UBFP3612	Packaging Technology	6	150
UBFP3613	Internship	6	150

Semester II

Theory Paper No, UBFP 121, Nutrition Science

Maximum Marks: 100 **Credits: 4**
Teaching Period: 4 /week **Teaching Load: 60 Theory Period/Semester**

Learning Objectives:

- To know basics of nutrition science and relationship between health & nutrition.
- To understand nutrients and food component that supply nourishment to the body.
- To know about the functions, deficiency and toxicity of nutrients
- To understand diet planning, food exchange list, BMI for different age groups.
- To understand malnutrition and its prevention

Learning Outcomes:

Students will be able to:

- Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.
- Provide nutrition counseling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies.
- Evaluate nutrition information based on scientific reasoning for clinical, community, and food service application.
- Utilize knowledge for development of the diet for different disease & age groups.

Unit-1 Basics of Nutrition **12 Periods**

Introduction to nutrition science, relationship between health and nutrition, role of public nutritionist in health care, interrelationship between nutrition and quality of life.

Unit-2 Food Constituents **12 Periods**

Food Constituents- Definition, Occurrence, Properties, Deficiency, Disorder and metabolisms of Protein, Carbohydrates and lipids, Vitamins & Minerals.

Unit-3 Basics for Diet planning **12 Periods**

Role of nutrients, Balance diet, Food exchange list and Principle of Meal Planning, Energy Balance- BMR, Recommended dietary allowances, Balanced diet for different age groups (infant to old age)

Unit-4 Diet for different groups **12 Periods**

Nutrition for Fitness and Sports, Therapeutic diets and effective nutritional counseling, Diet during Energy Imbalance and Diet for different diseases, Nutraceuticals & Functional Foods.

Unit-5 Problems associated with Nutrition **12 Period**

Malnutrition Causes, types, symptoms and presentation of Assessment of Nutrition status of the community, National Nutritional Policy

References:

- Bamji MS, Krishnaswamy K, Brahmam GNV (2009). *Textbook of Human Nutrition*, 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.
- Srilakshmi (2007). *Food Science*, 4th Edition. New Age International Ltd. 29
- Wardlaw MG, Paul M Insel Mosby (1996). Perspectives in Nutrition, Third Edition.
- B. Srilakshmi (2007) Dietetics, Revised Fifth Edition, New Age International Publishers

- B. Srilakshmi (2011) Nutrition Science, Third Edition, New Age International Publishers
- Dr. M. Swaminathan (2006) Advanced Text book on Food and Nutrition, Volume 1 and 2, Second Edition, BAPPCO Publication.
- Jim Mann and A. Stewart Truswell (2010) Essentials of Human Nutrition, Third Edition, Oxford Publication.
- Michael J. Gibney, Hester H. Vorster and Frans J. Kok (2002) Introduction to Human Nutrition, First Indian Reprint, Blackwell Publishing.
- Biochemistry of Foods-N.A.M Eskin, H.M. Henderson, R.J. Townsend.
- Introduction to Biochemistry of Foods, Z. Berk

First Year **Semester II**

Theory Paper No, UBFP122, Food Microbiology – II

Maximum Marks: 100 **Credits: 4**
Teaching Period: 4 /week **Teaching Load: 60 Theory Period/Semester**

Learning Objectives:
To enable the students to:
- Understand the various types of poisoning and infection caused by microorganism.
- Study various techniques used to study microorganisms.

Learning Outcomes:
Students should be able to:
- Explain the interactions between microorganisms and the food environment, and factors influencing their growth and survival.
- Explain the effects of fermentation in food production and how it influences the microbiological quality and status of the food product.
- Describe the characteristics of foodborne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification.

Unit-1: Microscopy and Staining Procedures **12 Periods**
Introduction & types of microscope, Definition of dye & stains, classification of stains- Acidic, Basic and Neutral, principles, procedure, mechanism & applications of staining procedures: simple staining, negative staining, differential staining- gram staining & acid fast staining.

Unit-2: Culture media and Pure culture Techniques **12 Periods**
Culture Media & its Composition, Types of culture media depending upon composition, function & applications and agar concentrations, Methods for isolation of pure culture- Streak plate, Pour plate and Spread plate.

Unit 3: Control of microorganisms **16Periods**
Quality of food, control at source- training, facilities and operations, equipment, cleaning and disinfection**,** Physical and chemical control methods.

Unit-4: Microbial spoilage of different foods **10 Periods**

Microbial spoilage of meat, poultry fish, fruits & vegetables, cereal & cereal products and milk & milk products.

Unit-5: Beneficial micro-organisms **15 Periods**

Introduction & types, general principle of culture preparation & maintenance, fermented foods – Yogurt, Wine, Idli, Soya sauce & Sauerkraut SCP, Production of amino acids, organic acids, enzymes, antibiotics, Prebiotic and Probiotic.

References:

- Food microbiology (IVth edition) - William C. Frazier and Dennis C. Westoff- Tata McGraw Hill Pub. Co. Ltd, New Delhi, 1995)
- Basic food microbiology-George G. Banwart (CBS publishers & distributors, New Delhi, 1987)
- Food microbiology- M. R. Adams & M. O. Moss (New Age International (P). Ltd. 2000)
- Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- Introduction to Microbiology, M.H.Gajbhiye& S.J. Sathe et al, Career Publications, Nashik, 2015
- Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993

First Year **Semester II**

Theory Paper No, UBFP123, Food Science – II

Maximum Marks: 100 **Credits: 4**
Teaching Period: 4 /week **Teaching Load: 60 Theory Period/Semester**

Learning Objectives:

- To make students aware about various cooking methods, food groups & their composition,
- To learn about nutritive value and effect of cooking on foods.

Learning Outcomes:

The student will be able to:

- To know about the basic cookery and the nutritive value of food products
- To classify the products according to properties
- To explain role of each food group products

Unit-1 Milk & Milk Products **10 Periods**

Composition & Nutritive value, physical properties, Milk cookery, White revolution, Milk substitute, Role of milk & milk products in cookery.

Unit-2 Sugar & Related Products **10 Periods**

Nutritive value, Properties, types, Characteristics & uses of sugar, sugar cookery & role of sugar in cookery, Sugar related products, Artificial sweeteners.

Unit -3 Fats & Oils **10 Periods**

Composition & Nutritive value, Specific fats & Oils, Effect of heating, role of fat or oil in cookery.

Unit 4 Egg and Flesh foods **15 Periods**

Egg: Structure of egg, composition & nutritive value, Egg cookery, role of egg in cookery.
Flesh Foods: Composition, nutritive value and cookery of meat, poultry & fish.

Unit 5 Beverages & appetizers **15 Periods**

Classification - Coffee, Tea, Cocoa and its processing, introduction to other beverages.

References:

- Outline of dairy technology by Sukumar De, Oxford University Press, New Delhi
- Food Facts & Principles – N. Shakuntala Manay, M. Shadaksharswamy
- Food Science – Sumati R. Mudambi, Shalini M. Rao, M.V.Rajagopal
- Essentials of Food Science – Vickie A. Vaclavik, Elizabeth W. Chrishtian
- Food Science (Vth edition) – Norman N. Potter and Joseph H. Hotchkiss (CSB Publishers and Distributors, New Delhi, 1996)

First Year **Semester II**

Practical Paper No, UBFP1211, Nutrition Science

Maximum Marks: 150 **Credits: 6**
Teaching Period: 2/week **Teaching Load: 24 Practical/Semester (4 Period each)**

Learning Objectives:

- To understand nutrients and food component that supply nourishment to the body.
- To know about the functions, deficiency of nutrients
- To understand diet planning, food exchange list, BMI for different age groups.

Learning Outcomes:

Students will be able to:

- Utilize knowledge from the physical and biological sciences as a basis for understanding the role of food and nutrients in health and disease processes.
- Provide nutrition counseling and education to individuals, groups, and communities throughout the lifespan using a variety of communication strategies.
- Utilize knowledge for development of the diet for different disease & age groups.

1)	Identification of food sources for various nutrients	2P
2)	Introduction to diet planning using food exchange list	3P
3)	Diet Planning of adult male / female	3P
4)	Assessment of weight and height of self and calculation of BMI	3P
5)	Planning of Protein and Energy rich dish.	2P
6)	Planning of Vitamin A rich dish.	1P
7)	Planning of Vitamin B1 rich dish.	1P
8)	Planning of Vitamin B2 rich dish.	1P
9)	Planning of Vitamin B3 rich dish.	1P
10)	Planning of Vitamin C rich dish.	1P
11)	Planning of Calcium rich dish.	1P
12)	Planning of Iron rich dish.	1P
13)	Record diet of self using 24 hour dietary recall	2P
14)	Evaluation of own diet and weight status	2P

References:

- Bamji MS, Krishnaswamy K, Brahmam GNV (2009). *Textbook of Human Nutrition,* 3rd edition. Oxford and IBH Publishing Co. Pvt. Ltd.
- Srilakshmi (2007). *Food Science,* 4th Edition. New Age International Ltd. 29
- Wardlaw MG, Paul M Insel Mosby (1996). Perspectives in Nutrition, Third Edition.
- B. Srilakshmi (2007) Dietetics, Revised Fifth Edition, New Age International Publishers
- B. Srilakshmi (2011) Nutrition Science, Third Edition, New Age International Publishers
- Dr. M. Swaminathan (2006) Advanced Text book on Food and Nutrition, Volume 1 and 2, Second Edition, BAPPCO Publication.

First Year **Semester II**

Practical Paper No, UBFP1212, Food Microbiology-II

Maximum Marks: 150 **Credits: 6**
Teaching Period: 2/week **Teaching Load: 24 Practical/Semester (4 Period each)**

Learning Objectives:
To enable the students to:

- To learn about various microbiological instruments.
- Understand the various types of bacteria, yeast & mold.
- Study various techniques used to study microorganisms.

Learning Outcomes:
Students should be able to:

- Explain the micro-organisms found in food producers.
- Describe the characteristics of food borne, waterborne and spoilage microorganisms, and methods for their isolation, detection and identification.

1.	Introduction to the Basic Microbiology Laboratory Instruments.	2P
2.	Introduction to the Basic Microbiology Laboratory materials	1P
3.	Functioning and use of compound microscope	1P
4.	Study of Aseptic Techniques	2P
5.	Preparation, Cleaning and sterilization of glassware	2P
6.	Preparation and sterilization of media	2P
7.	Preparation of slant, stab and plates using nutrient agar	2P
8.	Cultivation of microbes	2P
9.	Standard Plate Count Method	2P
10.	Monochrome staining	1P
11.	Gram's staining	1P
12.	Negative staining	1P
13.	MPN method for Coliform in food samples as well as water sample.	3P
14.	Visit to microbiology laboratory	1P
15.	Preparation of report on visit	1P

References:

- Food microbiology (IVth edition) - William C. Frazier and Dennis C. Westoff- Tata McGraw Hill Pub. Co. Ltd, New Delhi, 1995)
- Basic food microbiology-George G. Banwart (CBS publishers & distributors, New Delhi, 1987)
- Food microbiology- M. R. Adams & M. O. Moss (New Age International (P). Ltd. 2000)
- Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- Introduction to Microbiology, M.H.Gajbhiye& S.J. Sathe et al, Career Publications, Nashik, 2015

First Year **Semester II**

Practical Paper No, UBFP1213, Soft Skill Development

Maximum Marks: 150 **Credits: 6**
Teaching Period: 2/week **Teaching Load: 24 Practical/Semester (4 Period each)**

Learning Objectives:

- To learn about basic grammar & communication skills in English.
- To study about the letter & resume writing
- To learn about the research article /paper for publication & conference.
- To build confidence to students about English communication.

Learning Outcomes:

The student will be able to:

- To undersatnd the good communication skills
- Understand the grammar & vocabulary in good way.

1. Fluency in Grammar Usage **5P**

1) Tenses
2) Verbs
3) Active & Passive Voice
4) Reported Speech
5) Prepositions
6) Conjunctions
7) Effective Sentence-Construction
8) Vocabulary

2. Fundamentals **5P**

1) Greeting and taking leave
2) Introducing yourself
3) Introducing people to one another
4) Making requests and asking for directions
5) Congratulating, expressing sympathy and offering condolence
6) Making suggestions and offering advice
7) Making and accepting an apology

3. Situational dialogues **3P**

4. Personality development **3P**

5. Interview and Group discussion **3P**

6. Writing and comprehension skills **5P**

1) Letter (Formal) and Email
2) Report
3) Summarizing reports, articles, editorials
4) Making an abstract
5) Review writing
6) Writing resume

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