

# Waghire College of Arts, Commerce and Science, Saswad

Faculty of Bachelor of Vocation in Food Processing and Technology

# Structure and Syllabus for Four Year B. Voc. Degree in Food Processing and Technology as per National Education Policy - 2020

With effect from June 2024

# **Preamble: -**

The curriculum of the Food Processing and Technology program focuses on exposing students to the essential information needed for efficient design and development of processes used in the manufacturing of food products, along with the traditional background on these processes. The emphasis is given on the hands-on experience through practicals, labs and industry visits to deal with real world problems.

Food Processing and Technology is a multidisciplinary field that encompasses science, and technical elements of food. Food processing has potential to add value to the farm produce, increase the shelf life and reduce wastage of food. B. Voc. program is meant to produce socially responsible graduates with strong ethical and moral character, as well as good technological understanding. The students will learn to apply the principles of science (microbiology, biochemistry, chemistry) and engineering (transport phenomena, fluid mechanics, heat and mass transfer, food equipment and plant design etc along with the specialized courses in various domain of food processing (fruit and vegetables, dairy, meat & poultry, bakery & confectionary etc.). Graduates of Food Engineering and Technology will be prepared to work in the food sector areas such as quality control, plant and equipment design, instrumentation, production, research and development, and to become successful entrepreneurs.

#### **Objectives of the Programme:-**

- 1. To provide a mix of skills and general education content
- 2. To ensure students are work-ready at each exit point of the program
- 3. To provide flexibility to students with multiple exit points and pre-defined entry points
- 4. To enhance employability of students and meet industry requirements
- 5. To equip students to be part of the global workforce
- 6. To provide vertical mobility to students
- 7. To match industrial needs with greater emphasis on practical work, on the job training and Industrial internship.

# **Program Outcomes:**

- Students with vocational training can find work in several state and central government organizations, non-profit groups, and academic in situations and in private sectors as well.
- This program prepares students for specific types of occupations and frequently for direct entry into the market.
- After completion of this program students will have enough competences, to get benefit from market opportunities.
- This program would enable students to update their knowledge and professional skills for entering the work force executing income generating activities or occupying better positions
- Student can apply knowledge of general education subjects and skill development subjects to the conceptualization of food processing technologies.
- Students can create, select and apply appropriate processing technology/techniques, resources, modern processing tools in order to improve the quality, safety and the shelf life of fresh and process food.
- Students can understand the impact of food processing technologies solutions in asocietal context and demonstrate technical know-how and understanding of food safety, quality for sustainable development.

## Information:

- **1. One semester** = 15 weeks (12 weeks actual teaching and 3 weeks for internal evaluation, tutorials, problem solutions, student's difficulty solution, etc.)
- 2. As per NCrF :
  - > Theory course: A minimum of 15 hours of teaching per credit is required.
  - Laboratory course: A minimum of 30 hours in laboratory activities per credit is required.
- **3.** 1-credit theory = 15 hours i.e. for 1 credit, 1 hour per week teaching is to be performed.

15 hours of 1-credit are splinted as 12 hours actual teaching + 3 hours Tutorial (practice problem solving sessions, repeated discussion on difficult topics, and discussion on student's difficulties, questions discussion and internal evaluation)

4. 1-credit practical = 30 hours. Thus, 1 credit practical = 2 contact hours in laboratory per week

30 hours splinted as 24 hours' actual table work and 6 hours for journal competition, oral on each practical and other internal evaluation.

- 5. Each theory courses of any type (Major, Minor, VSC, VEC, OE/GE, VEC, SEC, CC, etc.) is of 2 credits.
  - **a. Theory per semester:** Contact hours = 24 teaching + 6 tutorials (problem solving sessions, repeated discussion on difficult topics, difficult solution, questions discussion and internal evaluation)
  - **b.** Each course will be of two modules, One module = 15 hours
  - **c.** Each module may consist of one or more than one chapter.
- 6. Each practical course of any course is of 2 credits = 60 hours per semester
  - **a.** Minimum 15 laboratory sessions must be conducted in one semester.
  - **b.** Each laboratory sessions should be 4 hours.
  - **c.** In 15 laboratory sessions maximum 2 demonstration sessions or table work sessions may be included and must be designed carefully for 4 hours' sessions.
  - **d.** 4 hours' laboratory sessions include performing table work (practical), calculation, writing results and conclusion, and submission of practical in written form to practical in charge.
  - **e.** Pre-laboratory reading and post laboratory work / questions should be assigned on each practical and this will be the part of internal evaluation.

#### 7. Design syllabus of each theory and practical course as per above guidelines.

- **a.** Theory syllabus should be given module wise and chapter wise.
- **b.** Theory syllabus should include name of topic, number of teaching hours allotted, detailed point wise syllabus, page numbers, references book no.
- **c.** It is recommended that, **design syllabus of one theory course from maximum two references books** and they will be called as main reference books/text books. Below that, you can add names of more reference books and they will be supplementary reference books.
- **d. Syllabus of practical** must be given practical wise. Name of experiment and aim of the experiment should be clearly mentioned. Mention reference book number or bibliography for each practical. At least 15 practical's must conducted.
- **e.** At the end of syllabus of theory and practical course, a list of references book should be given number wise.
- f. At the end of each theory and practical course 6 CO should be given.

#### 1. Eligibility

- a) No Candidates shall be admitted to the First Year of the B. Voc. Degree Course (2024pattern) unless he/she has passed the Higher Secondary School Certificate Examination of the Maharashtra State Board of Higher Secondary Education Board or equivalent or University with English as a passing Course.
- b) No candidate shall be admitted to the Third Semester examination of the second year unless he/ she have cleared first two semesters satisfactorily for the course at the college affiliated to this University.
- c) No student shall be admitted to the Third Year B. Voc. (Fifth semester) Degree Course (2024 pattern) unless she/she has cleared all the papers of first and second semester Examination of F.Y.B. Voc.
- d) No candidate shall be admitted to the Fifth Semester examination of the third year unless he/ she has cleared first two semesters satisfactorily of second year for the course at the college affiliated to this University.
- e.) No candidate shall be admitted to the Fourth Year B. Voc. (Seventh semester) Degree Course (2024 pattern) unless he/she has cleared all the papers of third and fourth semester Examination of S.Y. B. Voc.

#### 2. Examination:-

- A student cannot appear for semester end examination unless he/she has maintained 75% attendance during the teaching period of that course.
- If a student fails to maintain attendance up to 75%, at the time off illing of examination forms, an under taking from the student should be taken stating that he/she will be allowed to appear for examination subject to fulfillment of required attendance criteria during the remaining period of teaching of the course.
- Each credit will be evaluated for 25 marks.
- Each course will have a distribution of 30:70 for CIE and SEE.
- To pass a course, the student has to obtain at least forty percent marks in the CIE and SEE separately.
- If a student misses CIE examination, he/she will have a second chance with the permission of the teacher concerned. Such a second chance shall not be the right of the student; it will be the discretion of the teacher concerned to give or not to give second chance to a student to appear for internal assessment.
- A student cannot register for the third, fifth and seventh semester, if he/she fails to complete 50% credits of the total credits expected to be ordinarily completed within two semesters.
- No student shall be admitted to the Fifth Semester examination of the third year unless she/she has cleared first two semesters.

- No student shall be admitted to the Fourth Year B. Voc. (Seventh semester) Degree Course (2024 pattern) unless he/she has cleared all the papers of third and fourth semester Examination of S.Y. B. Voc. and has satisfactorily kept terms for the third year (Fifth and Sixth Semester).
- There shall be revaluation of the answer scripts of semester-end examination but not of internal assessment papersasperOrdinanceno134AandB.

#### 3. A.T.K.T. Rules:

The present relevant ordinances issued by the SPPU per taining to ATKT are applicable.

#### 4. University Terms

The dates for the commencement and conclusion of the first and the second terms shall be as determined by the University Authorities. Only duly admitted students can keeptheterms.Thepresentrelevantordinancespertainingtograntoftermswillbeapplicable.

#### 5. Verification And Revaluation

The candidate may apply for verification and revaluation or result through Principal of the College which will be done by the University as per ordinance framed in that behalf.

#### **6.** Restructuring Of Courses

This revised course structure shall be made applicable to the colleges implementing 'Restructured Programme at the undergraduate level from June, 2024. The Colleges under the Restructured Programme which has revised their structure in the light of the"2024Pattern"shallbeintroducedwitheffectfromacademicyear2024-25.

#### 7. Standard of Passing.

A candidate is required to obtain 40% marks in Internal Assessment, Practical Examination and Semester End University Examination.

It means that passing separately at internal assessment, practical examination and semester end university examination is compulsory.

#### 8. Methods Of Evaluation, Passing, And Evaluation Criteria:-

The evaluation of students will be done on three parameters: -

- a. Internal assessment
- **b.** Practical Examination(If applicable)
- c. University examination

For university examination, question papers will be set for seventy percent of the total marks allotted for the course.

Evaluation will be done on a continuous basis, three times during each semester. Internal assessment will be of thirty percent of the total marks allotted for the subject. The college's need to adopt any three out of the following methods for internal assessment:-

- a. Test
- b. Quiz
- c. Presentations
- d. Projects
- e. Assignments
- f. Tutorials
- g. Oral examination

Abbreviation	Full form

Type of courses offered under the NEP2020

Abbreviation	Full form	Purpose
ММ	Major Mandatory	Subject in which degree will be awarded
GE/OE	Generic Elective/Open Elective	To provide multidisciplinary knowledge
VSC	Vocational Skill Enhancement Course	Domain are a skill development
SEC	Skill Enhancement Course	Practical Training to enhance employability
VE C	Value Education Course	Environmental Science
IKS	Indian Knowledge System	Foundational guide to the history, culture and philosophy of India
CC	Co-Curricular Courses	Overall Development
AE C	Ability Enhancement Course	Languages proficiency
FP	Field Projects	For industry Experience
СЕР	Community Engagement Programme	Exposure to social issues
OJT	On the Job Training	Handson Training

#### **Credit Framework:**

# 2. Credit Framework under Three/Four-Years UG Programme with Multiple Entry and Multiple Exit options:

The structure of the Three/Four-year bachelor's degree programme allows the opportunity to the students to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per their choices and the feasibility of exploring learning in different institutions. The minimum and maximum credit structure for different levels under the Three/Four -year UG Programme with multiple entry and multiple exit options are as given below:

Lovole	Qualification	Qualification Credit Requirements		Semester	
Levels	Title	Minimum	Maximum	Demester	Year
4.5	UG Certificate	40	44	2	1
5.0	UG Diploma	80	88	4	2
5.5	Three Year Bachelor's Degree	120	132	6	3
6.0	Bachelor's Degree- Honours Or Bachelor's Degree- Honours with Rescarch	160	176	8	4

**Credit Framework** 

#### Structure and Subjects-First Year B. Voc. Food Processing and Technology Semester I

Course Type	Cours e	Paper Title	Hours/Week	Credits
Major Mandatory(06)	Major Mandatory(2credits)(30Hours)(1Credit=15 Hoursinasemester)	Food Preservation Technology	2	2
	Major Mandatory(2credits)(30Hours) (1Credit=15Hours) (2Lectureinamonthareoff)	Food Science	2	2
	Major Mandatory(2credits)(60Hours) (1Credit=30Hours) (1Credit=30HoursofLaboratorywork)	Food Preservation Technology(PR)	4	2
Open Elective(OE)	Open Elective(2credits)(30Hours) (1Credit=15Hours)	Agro Tourism	2	2
	Open Elective(2credits)(30Hours) (1Credit=15Hours)	Principles of Consumer behavior (PR)	4	2
Vocational Skill Development Course(VSC)	Vocational Skill Development Course(VSC)(2credits)(60Hours) (1Credit=30HoursofLaboratorywork)	Food Microbiology	2	2
Skill Enhancement Course(SEC)	Skill Enhancement Course (SEC) (2 credits)(30 Hours) (2Lectureinamonthareoff)	Food Microbiology(PR)	4	2
Ability Enhancement Course(AEC)	Ability Enhancement Course (AEC) (2credits)(30Hours)(2Lectureinamonthareof f)	Communicative skills and soft skills in English I	2	2
Value Education Course(VEC)	Value Education Course(VEC)(2credits)(30 Hours) (2Lectureinamonthareoff)	Environmental Studies-I	2	2
Indian Knowledge System(IKS)(Generic IKS)	Indian Knowledge System (IKS) (2 Credits)(30Hours) (2Lectureina month are off)	To be offered by the University	2	2
Co-Curricular Courses(CC)	Co-Curricular Courses(CC)(2credits)(30 OR60Hours)	Physical Education-I	@Department	2
		Total	-	22

#### Structure and Subjects-First Year B. Voc. Food Processing and Technology Semester II

Course Type	Course	Paper Title	Hours /Week	Credits
Major Mandatory(06)	Major Mandatory(4credits)(60Hours)(1Credit=15 Hoursinasemester)	Human Nutrition	2	2
	Major Mandatory (2credits)(30Hours) (1Credit=15Hours)(2Lectureinamonthareoff)	Food Chemistry	2	2
	Major Mandatory (2credits)(60Hours) (1Credit=30HoursofLaboratorywork)	Human Nutrition (PR)	4	2
Minor	Minor(2credits)(30Hours)(2Lect ureina month are off)	Fermentation Technology	2	2
Open Elective(OE)	Open Elective(2credits)(30Hours) (1Credit=15Hours)(2Lectureinamonthareoff)	E- Commerce	2	2
	Open Elective(2credits)(60Hours) (1Credit=30HoursofLaboratorywork)	Online Booking Process(PR)	4	2
Vocational Skill Development Course(VSC)	Vocational Skill Development Course(VSC)(2credits) (60 Hours) (1 Credit = 30 Hours of Laboratory work)	Food Chemistry(PR)	4	2
Skill Enhancement Course(SEC)	Skill Enhancement Course (SEC) (2 credits) (30Hours)(2Lectureinamonthareoff)	Fermentation Technology(PR)	4	2
Ability Enhancement Course(AEC)	Ability Enhancement Course (AEC) (2 credits) (30Hours) (2Lecturein a month are off)	Communicative Skills and Soft Skills in English II	2	2
Value Education Course(VEC)	Value Education Course(VEC)(2credits)(30Hours) (2Lectureinamonthareoff)	Environmental Studies - II (Otheroptions:UnderstandingIndia,DigitalandTechnologicalSolutions)	2	2
Co-Curricular Courses(CC)	Co-Curricular Courses (CC)(2)	Physical Education-II	@Department	2
		Total	-	22

# **Structure of Examination Programme**

Sr. No.	Subject Code	Course Category	Course/Subject Title Theory /Practical		Credits	Maximum Internal Marks	Maximum External Marks
1	FPT 101	Major Mandatory	Food Preservation Technology	Theory	02	15	35
2	FPT 102	Major Mandatory	Food Science	Theory	02	15	35
3	FPT 103	Major Mandatory	Food Preservation Technology(PR)	Practical	02	15	35
4	FPT 104	Vocational Skill Development Course(VSC)	Food Microbiology	Theory	02	15	35
5	FPT 105	Skill Enhancement Course (SEC)	Food Microbiology(PR)	Practical	02	15	35
6	FPT 106	Ability Enhancement Course(AEC)	Communication and soft skills in English I	Theory	02	15	35
7	FPT 107	Value Education Course(VEC)	Environmental Studies -I	Theory	02	15	35
8	FPT 108	Indian Knowledge System (IKS) (Generic IKS)	To be offered by the University	Theory	02	15	35
9	FPT 109	Co-Curricular Courses(CC)	Physical Education-I	@Department	02		
10	THM 106	Open Elective(OE)	Agro Tourism (From B. Voc. Tourism and Hospitality)	Theory	02	15	35
11	BRM 105	Open Elective(OE)	Principles of Consumer behavior (PR) (From B. Voc. Retail management)	Practical	02	15	35
			Total		22		

# B. Voc. in Food Processing and Technology Semester I As per NEP – 2020 Subject – Food Preservation Technology

#### **COURSE FPT 101 – FOOD PRESERVATION TECHNOLOGY**

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 101	Major Mandatory	Food Preservatio n Technology	2	2

- To understand the need to preserve food
- To study principle and importance of food preservation
- To understand the underlying principles of methods of food preservation used in the home
- To study different modern methods of food preservation

Credits(To tal Credits 2)	FPT 101 FOOD PRESERVATION TECHNOLOGY	No. of Lectures (30 L)
UNIT-I	Introduction of food preservation	8
	<ul> <li>Definition and scope of food preservation, principles of preservation. Traditional methods of Food Preservation</li> <li>Types of preservatives- Class I &amp; Class II,</li> <li>Sources food spoilage.</li> <li>.</li> </ul>	
UNIT-II	Food Preservation by high temperature	7
	• Introduction, classification and method of sterilization, pasteurization, blanching and canning	
UNIT-III	Food Preservation by Drying and dehydration	7
	<ul> <li>Definition, drying, scope of preservation, Differences between sun drying and Shade drying.</li> <li>Dehydration – definition, introduction, various types of mechanical dryers (Mechanical drying).</li> </ul>	

UNIT-IV	Food Preservation by Low temperature.	8
	• Introduction to refrigeration, cold storage and freezing, definition and principle of freezing, freezing curve, Changes occurring during freezing.	
	• Types of freezing-slow freezing, quick freezing,	
	Freeze drying, Introduction to thawing, changes during thawing and its effect on food.	

#### **References:**

- 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)
- Food Preservation, Desorier
- Unit Operations by Brennan & Cowell Lilly

# B. Voc. in Food Processing and Technology Semester I As per NEP – 2020 Subject – Food Science

#### **COURSE FPT 102 – FOOD SCIENCE**

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 102	Major Mandatory	Food Science	2	2

#### **Course Objective -**

- To understand meaning of Food, Food science and Food technology.
- To understand the objectives & Functions of food.
- To understand the scope and Opportunities in food technology.
- To known about basic food groups.
- To understand the methods of Cooking

Unit	<b>Content- FPT 102 Food Science</b>	No. of Lectures (30 L)
1	Introduction to Food Science and Technology	6
	<ul> <li>What is Food?</li> <li>Defination of Food Science and Technology</li> <li>Terms used in Food science and Technology(Food Processing, Food Microbiology, Food Chemistry, Food Additives, Food Packaging, Food Engineering, Food</li> </ul>	
	<ul> <li>Fermentation, Food Nutrition, Food Quality &amp; Analysis, Functional Food, Nutraceutical, Food safety &amp; regulations etc.)</li> <li>Objective of the study of Food science and Technology</li> <li>Functions of Food</li> </ul>	
2	Scope and Opportunities in Food Technology	3
	<ul> <li>Major food processing sector in india</li> <li>Skill gap management in food industry</li> <li>Organizational structures, Job role &amp; Opportunities</li> </ul>	
3	Basic Food Groups	6
	<ul><li>Classification of food group</li><li>Contribution of food group to the diet</li><li>Concept of Balanced diet</li></ul>	
4	Nutrients in Food	8
	<ul> <li>Classification of Nutrients (Micro &amp; Macro)</li> <li>Protein</li> <li>Carbohydrates</li> <li>Fats</li> <li>Water</li> </ul>	

	Vitamins	
	• Minerals	
5	Methods of Food Cooking	7
	Objective of Cooking food	
	Preliminary treatments of Cooking food	
	• Mode of heat transfer	
	Methods of Cooking	

#### **References** -

1. Bennion M, Introductory Foods, Macmillan Publishing Co. New York, 1980

2. Charley Helen, Food Science, John Wiley and Sons. 1971

3. Desrosier N. W. Elements of Food Technology, Te AVI Publishing Company, 1984

4. Fitch and Francis, Food and Principles of Cookery, Prentice-hall, Inc, 1959

5. Gates June C., Basic Foods 2nd Edition, New York, Holt Rinehart and Winston 1981

6. Gopalan C., B.V. Ramasastri and S.C. Balasubramanian, Nutitive Value of Indian Food, NIN Hyderabad, 2004

7. Gurr M.1., Role or Fats in Food and Nutrition, Elsevier Applied Science Publishers, 1984.

8. M. Shafiur Rahman, Handbook of Food Preservation, Marcel Dekker, Inc, NY, First Indian Reprint, 1999
9. Srilakshmi, B., Nutrition Science, Fourth Revised Edition: 2012, New Age International Limited, New Delhi, 2012

## **Subject – Food Preservation Technology (PR)**

#### **Practical Paper No-FPT 103- Food Preservation Technology (PR)**

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Practical perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 103	Major Mandatory	Food Preservatio n Technology (PR)	2	4

- To learn about the instruments used in food preservation.
- To study the different cooking methods.
- To study about the different types of preservative.
- To learn about Preparation of various products.

Sr. No.	FPT 103 FOOD PRESERVATION TECHNOLOGY(PR)	No. of Practical (4 periods each)
1	Introduction and demonstration of machineries used in food preservation.	1
2	To study the utensils used in food preservation.	1
3	To study effect of blanching on quality of foods	1
4	To study the effect of enzymatic browning in fruits and vegetables	1
5	Drying and preservation of green leafy vegetables or fruit slices in cabinet dryer.	1
6	Preservation of food by high concentration of sugar (preparation of jam)	1
7	Preservation of food by high concentration of salt and acid (preparation of pickle)	1
8	Drying and preservation of foods by freeze drying	1
9	Preparation of potato/ banana chips	1
10	Preservation by osmotic dehydration of foods (preparation of candy)	1
11	Drying and preservation of foods by spray drying process.	1

12	Preservation of milk by condensation or concentration	1
13	Preservation of foods by using chemicals (preparation of tomato ketchup)	1
14	Preservation by low temperature (Peas Preservation)	1
15	Visit to any food processing industry or unit	1

#### **Reference:**

• Srivastava R.P, Kumar Sanjeev (1994), Fruits and vegetable preservation, first edition, International book distributing co.

# B. Voc. in Food Processing and Technology Semester I As per NEP – 2020 Subject – Food Microbiology

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 104	VSC	Food Microbiology	2	2

- To provide a comprehensive understanding of the microbial world and its relevance to the food industry.
- To enable students to identify and differentiate between different types of microorganisms commonly found in food.
- To explore the factors influencing the growth and survival of microorganisms in food environments.
- To examine the role of microorganisms in food spoilage and the development of sensory attributes.

Unit	Food Microbiology	No. of Lectures (30L)
Ι	Introduction To Food Microbiology	(04 Lectures)
	<ul> <li>Definition and Scope of Food Microbiology.</li> <li>Types of microorganisms.</li> <li>Importance microorganisms in various foods.</li> <li>Contribution of Louis Pasteur.</li> </ul>	
II	Growth and Cultivation of Microorganisms	(08 Lectures)
	<ul> <li>Factor affecting growth of microorganisms.</li> <li>Growth curve.</li> <li>Microbial nutrition – nutritional requirements of microorganisms.</li> <li>Culture media – common components of media and their functions</li> <li>Principle, procedure and application of monochrome staining, negative staining and gram staining</li> </ul>	
III	Food Spoilage	(07 Lectures)
	<ul> <li>Source of food spoilage microorganisms.</li> <li>Spoilage of –</li> <li>i. Fruits and Vegetables</li> <li>ii. Meat and Poultry products</li> <li>iii. Canned foods</li> <li>iv. Bakery products</li> </ul>	

	v. milk	
IV	Microbial food poisoning and Food Infection	(07 Lectures)
	<ul> <li>Food Poisoning by – Staphylococcus aureus, Camphylobacter, Clostridium botulinum, Vibrio parahemolyticus</li> </ul>	
V	Control of Microorganisms	(04 Lectures)
	<ul> <li>Definitions of Sterilization, Disinfection, Antiseptic, Germicide, Microbiostasis, Antisepsis, Sanitization.</li> <li>Mode of action, application and advantages of: Physical agents, Chemical Agents , Gaseous Agents</li> </ul>	

#### **References:**

- 1. Adams M.R. and Moss M.O. "Food Microbiology" Second edition.
- 2. Frazier, W.C., and Westhoff, D.C. 1988. Food Microbiology, 4thed. McGraw-Hill, New York.
- 3. Jay, J.M. 2000. Modern Food Microbiology. 6 the d. Chapman & Hall. New York, N.Y.
- 4. Charles R. Lane, Paul Beales, Kelvin J. D. Hughes (2012). Fungal Plant Pathogens.1stEdn. CABI Publishing.
- 5. Banwart G. J. (1989). Basic Food microbiology, 2nd Edn. Chapman and Hall. International Thompson Publishing.
- 6. PurohitS.S."Microbiologyfundamentalsandapplications"Edition, 6. Publisher, Agrobios, 2003.
- 7. General Microbiology Stanier, 5th Ed.
- 8. Industrial Microbiology- A. H. Patel.
- 9. Industrial Microbiology- Lester Earl Casida

# B. Voc. in Food Processing and Technology Semester I As per NEP – 2020 Subject – Food Microbiology (PR)

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Practical perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 105	SEC	Food Microbiology (PR)	2	4

- To learn about the basic laboratory practices.
- To study the basic laboratory instruments, material & glassware's.
- To study about the functioning & use of microscope.
- To learn about Preparation of media & inoculation techniques.

Sr. No	FPT 104 FOOD MICROBIOLOGY (PR)	No. of Practical's
1	Introduction and demonstration of microbiology laboratory	1
	instruments e.g. Incubator, Hot Air Oven, Autoclave, Colorimeter,	
	pH Meter, Distillation Unit, Chemical Balance, Laminar air flow	
	hood, Clinical Centrifuge.	
2	Structure and working of light microscope.	1
3	Observation of microorganisms using bridge field microscope -	1
	Bacteria, Protozoa, Mold, Yeasts and Algae from natural habitat.	
4	Study cell morphology with simple Staining - Monochrome.	1
5	Study cell morphology with - Negative staining	1
6	Study cell morphology with gram Staining.	1
7	Preparation of culture media.	1
8	To sterilize the media and equipment.	1
9	Enumeration of bacteria from food/water.	3
	Spread plate method	
	Pour plate method	
	Streak plate method	
10	Observation of motility in bacterial by Hanging drop method.	1
11	Culturing the bacteria on a solid media by using serial dilution	1
	method and determining the number of viable cells in the culture.	
	(Total plate Count of milk)	
12	Isolation and identification of Aspergillus spp. from onions infected with Black Mould.	2

#### **Reference-**

- 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

# B. Voc. in Food Processing and Technology Semester I

#### **As per NEP – 2020**

#### Subject -COMMUNICATIVE SKILLS AND SOFT SKILLS IN ENGLISH

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 106	AEC	COMMUNICAT IVE SKILLS AND SOFT SKILLS IN ENGLISH I	2	2

- To train the students in practical writing skills.
- To develop competence in using English language for the career of their choice
- To develop an understanding of the need and importance of Business correspondence
- To enable students to communicate effectively in English both in written and Spoken modes.

Credits (Total Credits 2)	FPT 106 COMMUNICATIVE SKILLS AND SOFT SKILLS IN ENCLISH	No. of Lectures (30 L)
UNIT-I	An Introduction to Communication Skills	14
	<ul> <li>1.1 Introduction and Defining Communication</li> <li>1.2 The Process of Communication</li> <li>1.3 Principles of Communication</li> <li>1.4 Characteristics of Communication</li> <li>1.5 Barriers of Communication</li> <li>1.6 Oral Communication and Written Communication</li> <li>1.7 Verbal Communication and Non Verbal Communication</li> </ul>	
UNIT-II	Presentation Skills	8
	<ul> <li>2.1 Introduction, Defining Presentation</li> <li>2.2 Kinds of Presentations</li> <li>2.3 Format and Structuring Content</li> <li>2.4 Visual Aids</li> <li>2.5 Making a Presentation</li> <li>2.6 Tips for Effective Presentation</li> </ul>	
UNIT-III	Group Discussion	8

3.1 Introduction and Defining Group Discussion	
3.2 Steps involved in Group Discussion	
3.3 Do's and Don'ts of Group Discussion	
3.4 Participating in a Group Discussion	
3.5 Practice and Effective participation in a Group Discussion	

#### **References:**

- 1. Business Communication- Dr Saroj Hiremath
- 2. Business Communication- Dr. Dhiraj Zalte
- Literary Pinnacles- Orient Blackswan Publication
   Literary Landscapes- Orient Blackswan Publication
- 5. Communication Skills- Vision Publication

# B. Voc. in Food Processing and Technology Semester I As per NEP – 2020 Subject – Environmental Studies –I

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
Ι	B. Voc. FPT	FPT 107	VEC	Environmenta 1 Studies –I	2	2

#### **Course Objectives:**

1. Have awareness on issues with environmental pollution, their effects and possible solutions.

Gain knowledge of natural resources, their significance, and the effects of human activity on the resources in environment.
 Be familiar with biodiversity conservation and its significance.

4. Understand the need of sustainable development for future and become competent and socially responsible citizen of India.

Unit	Contents	Number
		of
		lectures
Ι	Environmental Studies	9
	1.Nature,Scope and Importance of Environmental Studies	
	2.Need for Public Awareness	
	3. History of our global environment	
	4. Natural resources and associated problems	
	5. Non-renewable resources	
	6. Renewable resources	
II	Ecosystems	7
	1.Concept,Structure and Function of an Ecosystem	
	2.Energy Flow in the Ecosystem	
	3. Ecological Succession, Food Chains, Food Webs and Ecological	
	Pyramids	
	4. Types of Ecosystem: Forest Ecosystem, Grassland Ecosystem Desert	
	Ecosystem, Aquatic Ecosystems	
III	Social Issues and the Environment	8
	1.Sustainable Development	
	2. Urban Problems Related to Energy, Water Conservation, Rain Water	
	Harvesting, Watershed Management	
	3. Climate Change, Global Warming, Acid Rain, Ozone Layer	
	Depletion, Nuclear Accidents and Holocaust, Waste land Reclamation,	
	Consumerism and Waste Products	
	4. Types of Pollution	
IV	Environmental legislation	6
	1. Environment Protection Act.	
	2. Air (Prevention and Control of Pollution) Act.	
	3. Water (Prevention and Control of Pollution) Act,	
	4. Wild life Protection Act. Forest Conservation Act.	

#### **References:**

- Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi
- Kaushik Anubha, C.P.Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd.Publishers
- Joseph Benny, Environmental Studies, Tata Mc Graw Hill Publishing Company Ltd., New Delhi Ubaroi, N.K., Environment Management, Excel Books, New Delhi

# SEMESTER II

# **Structure of Examination Programme**

Sr. No.	Subject Code	Course Category	Course/Subject Title	Theory /Practical	Credits	Maximum Internal Marks	Maximum External Marks
1	FPT 201	Major Mandatory	Human Nutrition	Theory	02	15	35
2	FPT 202	Major Mandatory	Food Chemistry	Theory	02	15	35
3	FPT 203	Major Mandatory	Human Nutrition (PR)	Practical	02	15	35
4	FPT 204	Minor	Fermentation Technology	Theory	02	15	35
5	FPT 205	Vocational Skill Development Course(VSC)	Food Chemistry(PR)	Practical	02	15	35
6	FPT 206	Skill Enhancement Course (SEC)	Fermentation Technology(PR)	Practical	02	15	35
7	FPT 207	Ability Enhancement Course(AEC)	Communicative and Soft Skills in English II	Theory	02		
8	FPT 208	Value Education Course(VEC)	Environmental Studies - II (Otheroptions:UnderstandingInd ia,DigitalandTechnologicalSoluti ons)	Theory	02	15	35
9	FPT 209	Co-Curricular Courses(CC)	Physical Education-II	@Department	02	15	35
10	BRM 206	Open Elective(OE)	E- Commerce II (From B. Voc. Retail Management)	Theory	02	15	35
11	THM 206	Open Elective(OE)	Online Booking Process (PR) (From B. Voc. Tourism and Hospitality Management)	Practical	02	15	35
			Total		22		

# **Subject** – HUMAN NUTRITION

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
II	B. Voc. FPT	FPT 201	MJT	HUMAN NUTRITION	2	2

- To understand nutrients and food component that supply nourishment to the body.
- To know about the functions, deficiency of nutrients
- To understand malnutrition and its prevention
- To identify and apply food principles to food and nutrition system.

Credits (Total Credits 2)	FPT 201 : - Human Nutrition	No. of Lectures (30 L)
UNIT-I	Nutrition	10
	<ul> <li>Introduction human nutrition : Definition, optimum nutrition, nutritional status, good nutritional status, poor nutritional status, malnutrition, under nutrition, signs of good nutritional status, signs of poor nutritional status, definition and functions of nutrients</li> <li>Macronutrients and micronutrients- Introduction, functions, deficiency and requirement</li> </ul>	
UNIT-II	Food and our body	6
	<ul> <li>Food and its functions.</li> <li>Digestion: Buccal digestion, gastric digestion and intestinal digestion, factors that affect digestion</li> <li>Absorption and metabolism of food.</li> </ul>	
UNIT-III	Energy Value	6

	<ul> <li>Introduction</li> <li>Recommended dietary allowance</li> <li>Energy value of food</li> <li>Daily BMR activities</li> <li>Biological value of food</li> </ul>	
UNIT-IV	Basics for Diet planning	8
	<ul> <li>Role of nutrients</li> <li>Balance diet, Food exchange list and Principle of Meal Planning.</li> <li>Balanced diet for different age groups (infant to old age)</li> </ul>	

#### **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.

# B. Voc. in Food Processing and Technology Semester II As per NEP – 2020 Subject – Food Chemistry

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
II	B. Voc. FPT	FPT 202	MJT	Food Chemistry	2	2

- To understand the chemistry of foods composition of food, role of each component and their interactions.
- To understand the functional aspects of food components and highlight their role in food processing.
- To develop the skills for structure, functions, metabolism of various components of food and their role in body.
- To introduce structure, nomenclature and properties of food constituents.

UNIT	FPT 202- Food Chemistry	No. of Lecture (30 L)
Ι	Introduction to Food Chemistry & Water	4
	<ul> <li>What is Food Chemistry</li> <li>History of Food Chemistry</li> <li>Approach to the study of Food Chemistry</li> <li>Structure of Water</li> <li>Phase diagram of Water</li> <li>Types of Water</li> </ul>	
II	Carbohydrates	8
	<ul> <li>Definition and nomenclature</li> <li>Structure of carbohydrates <ul> <li>Monosaccharides (glucose, fructose and galactose)</li> <li>Disaccharides (Sucrose, cellobiose, maltose and lactose)</li> <li>Polysaccharides (Starch, cellulose and glycogen)</li> <li>Chemical reactions of carbohydrates : oxidation, reduction, osazone and ester formation, isomerisation, &amp;Caramelization</li> </ul> </li> </ul>	
III	Lipids	7
	<ul> <li>Definition and Nomenclatures of Saturated &amp; Unsaturated Fatty Acids.</li> <li>Classification of Lipids- Simple, Complex, Derived &amp; Miscellaneous</li> <li>Composition of Fats</li> <li>Properties of Triglycerides (Hydrolysis, Rancidity, Saponification, Antioxidants)</li> <li>Lipid Processing (Lipid Refining &amp; Altering SFC of Food Lipids)</li> </ul>	

	<ul> <li>Chemicals deterioration of lipids-Hydrolytic &amp; Oxidative</li> <li>Function of lipids in foods</li> </ul>	
IV	Proteins & Enzymes	7
	<ul> <li>Structure of Amino acid (primary, secondary, tertiary and quaternary).</li> <li>Physicochemical Properties of Amino Acids</li> <li>Functional properties of proteins (Solubility, Viscosity, Water Binding, Gelatin, Cohesion- Adhesion, Elasticity, Emulsification, Foaming&amp; Fat and Flavor binding).</li> <li>Nature of Enzyme – Protein &amp; Non Protein</li> <li>Enzymatic and Non-Enzymatic Browning</li> <li>Enzymes in food industry</li> <li>Industrial Uses of Enzymes.</li> </ul>	
V	Vitamins & Minerals	4
	<ul> <li>Definition &amp; Introduction</li> <li>Structure of Water and Fat soluble Vitamins.</li> <li>Effect of processing on vitamins &amp; Minerals</li> </ul>	

#### **References:**

- 1. Fennema, Owen R, Food Chemistry, 3rd Ed., Marcell Dekker, New York, 1996
- 2. Whitehurst and Law, Enzymes in Food Technology, CRC Press, Canada, 2002
- 3. Wong, Dominic WS, Food Enzymes, Chapman and Hall, New York, 1995
- 4. Potter, N.N. and Hotchkiss, J.H, Food Science, 5th Ed., Chapman & Hall, 1995
- 5. DeMan, John M., Principles of Food Chemistry ,3rd Ed., Springer 1999
- 6. Desrosier, Norman W. and Desrosier., James N., The technology of food preservation, 4th Ed., Westport, Conn. : AVI Pub. Co., 1977.
- 7. Fuller, Gordon W, New Product Development From Concept to Marketplace, CRC Press, 2004.
- 8. Manay, S. & Shadaksharaswami, M., Foods: Facts and Principles, New Age Publishers, 2004
- 9. Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetable Products, 2nd ed. TMH Education Pvt. Ltd, 1986
- 10. Essentials of Food Science Vickie A. Vaclavik, Elizabeth W. Chrishtian

# **Subject** – HUMAN NUTRITION (PR)

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Practical perWeek in Clock Hour
II	B. Voc. FPT	FPT 203	MJP	HUMAN NUTRITION (PR)	2	4

- To learn about the instruments used in food preservation.
- To study the different cooking methods.
- To study about the different types of preservative.
- To learn about Preparation of various products.
- •

Sr. No.	Content	No. of Practical (4 periods each)
1	To study the assement of weight and height of self and calculation of BMI.	1
2	To study the identification of food source for various nutrient.	1
3	To study the diet planning using food exchange.	1
4	To study the diet planning of adult male and female.	1
5	To study the diet planning of adolescence girl/boy.	1
6	To study diet planning using food exchange list.	1
7	Preparation of high fiber product.	1
8	Preparation of high protein product from plant source.	1
9	Preparation of high protein product from animal source.	1
10	Preparation of high fat product.	1
11	Preparation of low fat product.	1
12	To study planning of calcium rich dish ragi burfi.	1
13	To study planning of iron rich dish.	1
14	To study planning of Vit B3 rich dish Peanut butter.	1
15	Preparation of high carbohydrate product from cereals.	1

#### **Reference:**

- Srivastava R.P, Kumar Sanjeev (1994), Fruits and vegetable preservation, first edition,
- International book distributing co.
- 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.

#### **Subject** – FERMENTATION TECHNOLOGY

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
II	B. Voc. FPT	FPT 204	Minor	FERMENTATI ON TECHNOLOG Y	2	2

#### **Course Objective -**

- To learn about the fermentation technology.
- To study the history & innovations in fermentation.
- To study about the scope of food fermentation.
- To learn about important fermentation techniques and equipments.

Unit	Content - FPT 204 Fermentation Technology	No. of
		Lectures
		( <b>30 hrs</b> )
Ι	Introduction of Fermentation	s5
	Definition & introduction of Fermentation	
	History of Fermentation	
	Scope & importance of Fermented products.	
II	Microorganisms involved in Fermentation	6
	Microorganisms used in fermentation	
	Type of Fermentation	
	Fermenter -Working, Parts etc.	
III	Fermentation of Alcoholic Beverages	8
	Malt Beverages	
	Distilled liquors	
	Vinegar	
	Acetic acid	
IV	Oriental Fermented Foods	11
	Milk based fermented products - kefir, koumiss, yogurt etc.	
	Meat based fermented products -Salami, fermented fish, Sausage	
	etc.	
	Plant based fermented products -saurkraut, Tempeh, etc	
	Cereal & pulses based fermented products - Kimchi, Natto etc	

#### **References** -

- BamjiMS,KrishnaswamyK,BrahmamGNV(2009).*TextbookofHumanNutrition*,3rdedition.Oxfordand IBHPublishingCo.Pvt.Ltd.
- Srilakshmi(2007). Food Science, 4th Edition. New Age International Ltd. 29
- WardlawMG,PaulMInselMosby(1996).PerspectivesinNutrition,ThirdEdition.
- $\bullet \quad B. Srilak shmi (2007) Dietetics, Revised Fifth Edition, New Age International Publishers$
- B.Srilakshmi(2011)NutritionScience,ThirdEdition,NewAgeInternationalPublishers
- ٠

# Subject – FOOD CHEMISTRY (PR)

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Practical perWeek in Clock Hour
II	B. Voc. FPT	FPT 205	VSC	FOOD CHEMISTRY (PR)	2	4

#### **Course Objective -**

- Understand the methods of proximate analysis of food.
- Know different types of solution
- Know the methods of proximate analysis of food.
- Prepare different types of solution.

Sr. No.	Content	No. of Practical
1	Preparation of primary and secondary solutions	1
2	Estimation of Moisture from food sample.	1
3	Estimation of total ash from food sample.	1
4	Determination of protein	1
5	Estimation of Fiber from food sample.	1
6	Determination of percent free fatty acids.	1
7	To detect the adulteration of fats and oils by qualitative test.	1
8	Estimation of reducing and non-reducing sugars.	1
9	Estimation of Carotenoid content & Analysis by spectrophotometer method	1
10	Determination Hardness of water	1
11	Determination of Acid value	1
12	Determination of pigments by using paper chromatography technique.	1
13	Estimation of salt content	1
14	Qualitative test for Photochemical	1
15	Visit to Food Analytical Laboratory and report submission	1

#### **References** -

1. Connie M. Weaver, James R. Daniel, The Food Chemistry Laboratory: A Manual for Experimental Foods, Dietetics, and Food Scientists, 1996.

2. Dennis D. Miller, FoodChemistry: A LaboratoryManual, (Wiley 2017)

3. MorrisB.Jacobs, The chemical analysis offoods and food products, (CBS Publishers and distributors New Delhi.3rd edition.

4. S. Ranganna, Hand book of analysis and quality controlforfruit and vegetable products,(TataMcGrawHillPublishingCo. New Delhi

#### **Subject** – FERMENTATION TECHNOLOGY (PR)

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Practical perWeek in Clock Hour
II	B. Voc. FPT	FPT 206	SEC	<b>Fermentation</b> <b>Technology</b> (PR)	2	4

#### **Course Objective -**

- To understand the different types of fermentation.
- To understand the various fermented products.
- To learn about the analysis of fermented product
- To introduce types of fomenters, equipments and instruments.

Sr. no	Content - FPT 206 Fermentation Technology (PR)	No. of Practical's
1	Types of fermentation	1
2	Demonstration of various type fomenters	1
3	Preparation of Sauerkraut	1
4	Preparation of yogurt	1
5	Preparation of wine	1
6	Preparation of beer	1
7	Preparation of soya sauce	1
8	Preparation of Miso	1
9	Preparation of cheese	1
10	Preparation of Kombucha	1
11	Preparation of Idli	1
12	Analysis of fermented food products	1
13	Preparation of kefir	1
14	Preparation of Natto	1
15	Visit to winery or any other fermented products based industry and report submission.	1

#### **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.

# B. Voc. in Food Processing and Technology Semester II

#### As per NEP – 2020

#### Subject – COMMUNICATIVE SKILLS AND SOFT SKILLS IN ENGLISH II

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credits	Lectures perWeek in Clock Hour
II	B. Voc. FPT	FPT 207	AEC	COMMUNICAT IVE SKILLS AND SOFT SKILLS IN ENGLISH II	2	2

#### **Course Objective -**

- To enrich communicative competence among students and thereby linguistic competence
- To inculcate human values and social awareness through the literary pieces
- To expose students to varied cultural experiences through literature
- To inculcate a sense of cultural diversity through language and literature

Credits (Total Credits 2)	FPT 109 COMMUNICATIVE SKILLS AND SOFT SKILLS IN ENGLISH II	No. of Lectures (30 hrs)
UNIT-I	An Introduction to Soft Skills	10
	<ul> <li>1.1 Team building, Leadership and Coordination Skills</li> <li>1.2 Time Management</li> <li>1.3 Goal Setting and SWOT Analysis</li> <li>1.4 Manners, Etiquettes and Ethics</li> <li>1.5 Effective Listening and Speaking Skills</li> <li>1.6 Stress Management and Positive Attitude</li> </ul>	
UNIT-II	Interview and Interviewing Skills	10
	<ul> <li>2.1 Introduction</li> <li>2.2 Essential Features of an Interview</li> <li>2.3 Types of Interview</li> <li>2.4 Techniques or Guidelines for an Interviewee</li> <li>2.5 Solution of Common Problems for an Interviewee</li> </ul>	
UNIT-III	Resume Writing and Job Application Letters	10
	<ul> <li>3.1 Introduction</li> <li>3.2 Essential Elements of Bio-data</li> <li>3.3 Resume Writing</li> <li>3.4 Curriculum Vitae</li> <li>3.5 Drafting of Job Application Letter</li> <li>3.6 Samples and Practice</li> </ul>	

#### **References:**

#### SuggestedReferenceBooks:

- 1. Business Communication- Dr Saroj Hiremath
- 2. Business Communication- Dr. Dhiraj Zalte
- 3. Literary Pinnacles- Orient Blackswan Publication
- 4. Literary Landscapes- Orient Blackswan Publication
- 5. Communication Skills- Vision Publication

#### Subject – Environmental Studies-II

Semester No.	Programme Name	Subject Code	Type of Course	Course Title	Credi ts	Lectures perWeek in Clock Hour
II	B. Voc. FPT	FPT 208	VEC	Environmental Studies-II	2	2

#### Course Objective –

- This course will provide a comprehensive knowledge of mechanism of Ecological System.
- Students will be enabled to understand the various environmental issues and Legislation.
- This course will help students to understand the various elements of ecological System and its impact.
- Students will be understanding the consequences of human actions on the web of life, global economy, and quality of human life

Unit	Title and Contents- Environmental Studies-II	No. of Lectures (30 hrs)
Ι	Environmental Policies & Practices	10
	Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture Environment Laws: Environment Protection Act, Air (Prevention, & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.	
II	Human Communities and the Environment	10
	Human population growth: Impacts on environment, human healthand welfare. Resettlement and rehabilitation of project affected persons;case studies. Disaster management: floods, earthquake, cyclones and landslides. Environmental ethics and Environmental movements: Chipko, Silent valley, Bishnoi's of Rajasthan in environmental conservation.	
III	Environmental communication and public awareness	10
	Case studies (e.g. CNG vehicles in Delhi), National Climate Action Programme (NCAP)	

#### **References:**

- Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi
- Kaushik Anubha, C.P.Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd.Publishers
- Joseph Benny, Environmental Studies, Tata Mc Graw Hill Publishing Company Ltd., New Delhi

# **Teaching Methodology**

The Teacher can use the following Methods as Teaching Methodology:

- 1. Class Room Lectures
- 2. Guest Lectures of Professionals, Industry Experts etc.
- 3. Teaching with the help of ICT tools
- 4. Visits to various Industries, / Industry Units
- 5. Group Discussion / Debates
- 6. Assignments, Tutorials, Presentations, PPTetc.
- 7. YouTube Lectures developed by MHRD, UGC, Government of Maharashtra, University etc.
- 8. Analysis of Case Studies.

Scheme of Exam	ination					
Scheme of Examination: 1. Internal Assessment: 30% and 2. External Assessment: 70%						
Scheme	Exam Format	Min.				
of		Passing Marks				
Examinat						
ion						
Continuous	The colleges need to adopt any Two Methods out of the	Min. 06				
Internal	following Methods for Continuous Internal Evaluation:	Marks				
Evaluation	1) Offline Written Examination	(40% of				
(CIE)	2) Power Point Presentations	Passing				
		)				
(15 Marks)	3) Assignments / Tutorials					
	4) Oral Examination					
	5) Open Book Test					
	6) Offline MCQ Test					
	7) Group Discussion					
	8) Analysis of Case Studies					
SEE /	Instructions:	Min. 14 Marks				
External	1) Question No. 1 and 5 are Compulsory.	(40% of Passing)				
Exam	2) Attempt any Two Questions from Question No. 2 to 4	-				
(35 Marks)						
(Total 2	Q. 1: Fill in the Blanks $= 05$ Marks					
Hours	Q. 2: Theory Question on Unit-1 = 10 Marks					
Duration)	Q. 3: Theory Question on Unit-2 $= 10$ Marks					
,	O. 4: Short Notes on all Units (Any 2 out of 4) $= 10$ Marks					
	$\vec{Q}$ . 5: Broad Question on Unit-3 = 10 Marks					
	Total 50 Marks					
Separat	e Passing for Internal Assessment (CIE) and External Exam					
•	(SEE)					