CURRICULUM

FOR

SECOND SEMESTER

OF

THREE-YEAR

DIPLOMA COURSES

IN

POLYTECHNICS

OF

UNION TERRITORY

OF

JAMMU AND KASHMIR

CURRICULUM

FOR

SECOND SEMESTER

DIPLOMA IN

FOOD TECHNOLOGY

SUBJECT STUDY SCHEME (2nd Semester: Food Technology)

Course Code	Subjects	TIME IN HOURS				CREDITS		
		Theory	Tutorial	Practical	Total	Theory	Practical	Total
BS201	Applied Mathematics-II	3	1	--------	4	4	--------	4
ES202	Introduction to Computers and Information Technology	---	---	4	4	----	2	2
HS203	Language & Communication Skills – II	3	--------	---	3	3	---	3
HS204	Language & Communication Skills – II Lab	---	--------	2	2	---	1	1
FTPC201	Basic Microbiology	3	--------	---	3	3	---	3
FTPC202	Basic Microbiology Lab	---	--------	2	2	---	1	1
FTPC203	Technology of Fruit and Vegetables	3	--------	----	3	3	---	3
FTPC204	Technology of Fruit and Vegetables Lab	----	--------	2	2	---	1	1
FTPC205	Food Chemistry & Nutrition	2	--------	---	2	2	---	2
FTPC206	Food Chemistry & Nutrition Lab	---	--------	4	4	---	2	2
	Total	14	1	14	29*	15	7	22

* Note: The remaining 1 hour in a week shall be utilized for sports and other activities like debates, seminar etc.

PROGRAM: THREE YEAR DIPLOMA IN ENGINEERING AND TECHNOLOGY *	
Course Code: **BS201**	Course Title: **Applied Mathematics-II**
Semester: **2nd**	Credit: **4**
Periods Per Week: **4 (L: 03, T: 01, P: 0)**	

(* Common to Architecture Assistantship, Automobile, Civil, Civil(PHE), QSCM,Computer , Electrical , E&C,Medical Electronics, Food Technology, I&C,Leather Technology, Mechanical,Textile Technology, Wood Technology and IT)

COURSE OBJECTIVE:

This course is designed to develop an understanding of basic mathematical and statistical tools which include matrices, determinants, integral calculus and coordinate geometry and the applications of such tools in the field of engineering and technology

COURSE CONTENT

1. Integral Calculus

1.1 Integration as inverse operation of differentiation

1.2 Simple integration by substitution, by parts and by partial fractions (for Linear factors only)

1.3 Evaluation of definite integrals (simple problems)-

Evaluation of $\int_0^{\pi/2} \sin^n x\, dx$, $\int_0^{\pi/2} \cos^n x\, dx$, $\int_0^{\pi/2} \sin^m x \cos^n x\, dx$

Using formulae without proof (m and n being positive integers only)

2. **Coordinate Geometry**

2.1 Equation of straight line in various standard forms (without proof), intersection of two straight lines, angle between two lines. Parallel and perpendicular lines, perpendicular distance formula.

2.2 General equation of a circle and its characteristics. To find the equation of a circle, given: Centre and radius, three points lying on it and coordinates of end points of a diameter.

2.3 Definition of conics (Parabola, Ellipse, Hyperbola) their standard equations without proof. Basic problems on conics when their foci, directrices or vertices are given.

3 Matrices and Determinants

3.1 Definition of matrix and its types.

3.2 Addition, subtraction and multiplication of matrices.

3.3 Expansion of Determinants.

4 Statistics

4.1 Measures of Central Tendency: Mean, Median, Mode

4.2 Measures of Dispersion: Mean deviation, Standard deviation
4.3 Basic Concepts of Probability.

COURSE OUTCOME

After the completion of the course the student will be able to:

- evaluate both indefinite and definite integrals by various methods
- identify various points in a 2-D space along with formulation of equations and graphs for different types of lines, circles, ellipses, parabolas etc.
- find the sum, difference and product of two or more matrices,
- evaluate determinants and their relations to matrices
- find the mean, median, mode and other measures of central tendency.
- solve basic problems on probability.

RECOMMENDED BOOKS:

1. R.D Sharma, Applied Mathematics-II.
2. H.K Das, Applied Mathematics.
3. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.
4. S.S. Sabharwal, Sunita Jain, Eagle Parkashan, Applied Mathematics, Vol. I & II, Jalandhar.
5. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi.
6. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi
7. Applied Mathematics-II, Eagle Publications.

UNIT WISE TIME AND MARKS DISTRIBUTION

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	16	35
2	10	20
3	12	25
4	10	20
Total	**48**	**100**

PROGRAM THREE YEAR DIPLOMA IN ENGINEERING AND TECHNOLOGY	
Course Code: **ES202**	Course Title: **Introduction to Computers and Information Technology**
Semester:**2nd**	Credit: **2**
Periods Per Week: **4 (L: 0 T: 0 P: 4)**	

(* Common to Architecture Assistantship, Automobile, Civil, Civil(PHE), QSCM,Computer , Electrical , E&C,Medical Electronics, Food Technology, Garment Technology, I&C,Leather Technology, Mechanical, Textile Design, Textile Technology, Travel and Tourism, MLT, Wood Technology and IT)

COURSE OBJECTIVE

Information technology has great influence on all aspects of our life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools of MS Office/Open Office using internet etc. form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

COURSE CONTENT

1. **Basics of Information Technology**
   - 1.1. Its concept and scope, applications of IT, ethics and future with information technology.
   - 1.2. Impact of computer and IT in society.
   - 1.3. Computer application in office, book publishing, data analysis, accounting, investment, inventory control, graphics, air and railway ticket reservation, robotics, military, banks, Insurance financial transactions and many more.

2. **Basic Components of Computer System**
   - 2.1. Block diagram of a computer System and Processing of Data.
   - 2.2. Demonstration of computer system viz., Hardware, Software
   - 2.3. Concept of Memory and its various types, Primary and secondary memories (RAM, ROM, Storage Devices etc).

3. **Internet and its Applications**
   - 3.1. Introduction to Internet, its basic working.
   - 3.2. Concept of Email, Social Media, Cloud Computing.
   - 3.3. Basic ideas about IP Address, DNS, URL, Server, Web Browser, LAN etc.

4. Use of Various Basic Data Processing Softwares

4.1. Word Processing (Microsoft Word & Google Docs.)

4.1.1. File Management:

4.1.1.1. Opening, creating and saving a document, locating files, copying contents in some different file(s).

4.1.2. Editing a document:

4.1.2.1. Entering text, Cut, copy, paste using tool- bars

4.1.3. Formatting a document:

4.1.3.1. Using different fonts, changing font size and colour, changing the appearance through bold/ italic/ underlined, highlighting a text, changing case, using subscript and superscript, using different underline methods

4.1.3.2. Aligning of text in a document, justification of document, Inserting bullets and numbering

4.1.3.3. Formatting paragraph, inserting page breaks and column breaks, line spacing

4.1.3.4. Use of headers, footers: Inserting footnote, end note, use of comments

4.1.3.5. Inserting date, time, special symbols, importing graphic images, drawing tools

4.1.4. Tables and Borders:

4.1.4.1. Creating a table,

4.1.4.2. Formatting cells,

4.1.4.3. Use of different border styles, shading in tables,

4.1.4.4. Merging of cells, partition of cells, inserting and deleting a row in a table

4.1.5. Print preview, zoom, page set up, printing options

4.1.6. Using Find, Replace options

4.2. Microsoft-Excel and Google Sheets

4.2.1. Introduction to Spreadsheet Application-Workbook and Worksheets

4.2.2. Working with data and formulas:

4.2.2.1. Addition, subtraction, division, multiplication, percentage and autosum.

4.2.2.2. Format data, create chart, printing chart, save worksheet, creating and formatting of charts and graphs

4.3. Presentation (Microsoft-PowerPoint and Google Slides)

4.3.1. Introduction to PowerPoint - How to start PowerPoint - Working environment: concept of toolbars, slide layout, templates etc. - Opening a new/existing presentation - Different views for viewing slides in a presentation: normal, slide sorter etc.

4.3.2. Addition, deletion and saving of slides.

4.3.3. Insertion of multimedia elements - Adding text boxes, importing

pictures, movies and sound, tables and charts etc.

4.3.4. Formatting slides - Text formatting, changing slide layout, changing slide color scheme - Changing background, Applying design template.

4.3.5. Viewing the presentation using slide navigator

COURSE OUTCOME

After the completion of the course the student will be able to:

- Identify the different hardware components and functional units of a Computer system.
- Explain basic concepts and working of internet.
- Create and format word documents by using different word processing software.
- Prepare the spread sheets and the presentation of data in different ways.
- Prepare power point presentations.

RECOMMENDED BOOKS:

1. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd-Jungpura, New Delhi
2. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
3. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
4. Basics of Information Technology, by Ishan Publications, Ambala
5. Information Technology for Management by Henery Lucas, 7th edition, Tata McGraw Hill Education Pvt Ltd, New Delhi

UNIT WISE TIME AND MARKSDISTRIBUTION

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	10
2	13	20
3	13	20
4	32	50
Total	**64**	**100**

PROGRAM THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code **: HS203**	Course Title**: Language & Communication Skills – II**
Semester**: 2ND**	Credits**: 03**
Periods per Week**: 3 (L: 3 T: 0 P:0)**	

COURSE OBJECTIVE:

The objective of this course is to develop effective communication skills and also to inculcate soft skills among the students in professional and inter-personal communications facilitating their all-round development of personality. At the end of the course, the student will be able to develop comprehension skills, Professional etiquettes; improve vocabulary; use proper grammar; acquire writing skills and explore various aspects of soft skills.

COURSE CONTENT

Unit 1: Short stories and Poetry (08hrs)

1.1 Section A: - Short Stories
- Three Questions : Leo Tolstoy
- The last leaf : O Henry

1.2. Section B:-Poems
- The Psalm of life : H.W. Longfellow
- Say Not Struggle Naught Availeth : A.H. Clough

Unit 2: Essentials of Grammar (10hrs)

2.1. Basics of grammar (Parts of speech)
2.2. Subject -Verb Agreement
2.3. Tenses
2.4. Voice (Active and Passive)
2.5. One word substitution
2.6. Correct /Incorrect sentences

Unit 3. Techniques of Writing. (10hrs)

3.1. Comprehension of an Unseen Passage
3.2. Paragraph Writing
3.3. Circulars
3.4. Memos

Unit 4: Soft Skills (12hrs)

4.1. Intrapersonal and Interpersonal skills - Meaning and Importance.

4.2. Self-Management Skills

- Goal setting- Meaning, Importance, types and ways to achieve goals.
- Time Management- Meaning, benefits and strategies to improve time management.
- Self-motivation -Meaning and Importance.
- Stress management -.Meaning, Causes and Techniques of stress management.
- Positive Thinking
- Problem-solving- Meaning, Steps and importance.
- Decision Making - Meaning, process/stages and Importance of decision making

4.3. Team work and Leadership skills -Concept of Teams; Building effective teams; Concept of Leadership and honing Leadership skills.

Unit 5: Etiquettes (08hrs)

5.1. Etiquettes - Meaning, Types and Importance

5.2. Professional etiquettes- ABC (Appearance, Behavior, Communication) of Professional Etiquettes, Importance of Professional etiquettes.

- Office Etiquette - Meaning, Importance and Tips.
- Meeting etiquettes - Meaning, Importance and Tips.
- Telephone etiquettes.

COURSE OUTCOME

After the completion of the course the student will be able to:

Unit 1:

- Read, analyze, and interpret works of literature.
- Make themselves proficient in literary contexts.
- Learn different words in the text which in turn will enhance their language (Vocabulary).

Unit 2:

- Identify the different parts of speech and their usage in the sentence.
- Know about the application of various grammatical items like Subject-Verb Agreement, Tenses, and Voice etc.
- Enrich his/her vocabulary and enhance grammar accuracy.

Unit 3:

- Comprehend the passage and able to answer the linked questions.
- Plan, organize and present ideas coherently on a given topic.
- Compose circulars and memos which in turn will enhance their writing skill.

Unit 4:

- Set goals, manage time and stress, solve problems and organize oneself effectively.
- Know about self-motivation and its importance.
- be a team player and know how to develop leadership skills.

Unit 5:

- Demonstrate personal and professional etiquettes.

RECOMMENDED BOOKS:

1. Kulbhushan Kumar," Effective Communication Skills", Khanna Publishing House, New Delhi (Revised Edition 2018)
2. M. Ashraf Rizvi,"Effective Technical Communication". Mc-Graw Hill: Delhi, 2002.
3. Sanjay Kumar and PushpLata, "Communication Skills "Oxford University Press, 2011
4. Meenakshi Raman &Sangeeta Sharma, "Technical Communication: Principle and Practice". New Delhi:OUP, 2011.
5. Francis Peter S.J.,"Soft Skills and Professional Communication"
6. K.R. Lakshminarayana& T. Murugavel, "Managing Soft Skills", Scitech Publications. 2009
7. NK Aggarwal and FT Wood, "English Grammar, Composition and Usage".Macmillan Publishers India Ltd; New Delhi.
8. Dr. Alex, "Soft skills"
9. Gopalaswamy Ramesh and MahadevanRamesh,"The Ace of Soft Skills: Attitude, Communication and Etiquette for Success". Pearson

UNIT WISE TIME AND MARKS DISTRIBUTION

UNIT	TIME (Hrs)	MARKS (%age)
1	08	20
2	10	20
3	10	20
4	12	25
5	08	15
TOTAL	**48**	**100**

PROGRAM THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code **:HS204**	Course Title**: Language & Communication Skills – II Lab**
Semester**: 2nd**	Credits**: 01**
Periods per Week**: 2 (L: 0 T: 0 P:2)**	

COURSE OBJECTIVE:

Language is the most commonly used medium of self-expression in all spheres of human life personal, social and professional. A student must have a fair knowledge of English language and skills to communicate effectively to handle the future jobs in industry. The objective of this course is to develop effective communication skills and also to inculcate soft skills among the students in professional and inter-personal communications facilitating their all-round development of personality. At the end of the course, the student will be able to develop comprehension skills, Professional etiquettes; improve vocabulary; use proper grammar; acquire writing skills and explore various aspects of soft skills. It is expected that each polytechnic will establish a communication skill laboratory for conducting practicals mentioned in the curriculum.

LIST OF PRACTICALS:

1. Ice breaking Activity and JAM session
2. Developing conversational ability - Describing yourself, describing objects around you, Describing People.
3. Situational Dialogues- Role Play- Expressions in various situations- Self introduction and introducing others- Greetings- Taking Leave - Apologies- Requests etc.
4. Listening with Comprehension-Listening to recorded lectures, poems, interviews, speeches, documentaries etc. - Taking notes while listening
5. Professional etiquettes- Netiquette, Telephone Etiquette, Introduction and first impression, Business meeting etiquette, Dressing and Dinning Etiquette.
6. Reading articles from newspaper, magazines, journals etc.
7. Public speaking - Extempore and Impromptu Speech
8. Grammar - Words often misspelt - confused/ misused; Common errors in pronunciation; Idiomatic expressions.
9. Professional Skills- Drafting Job Application Letter, CV/ Resume; Interview skills.
10. Demonstrating the do's and don'ts of facing the interview.

PROGRAM: THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC201**	Course Title: **BASIC MICROBIOLOGY**
Semester: **2nd**	Credit: **3**
Periods Per Week: **3 (L: 3 T: 0 P: 0)**	

COURSE OBJECTIVE

The main objectives of this subject are to develop knowledge and skills in the students in the following major areas:

a). The nature of micro-organisms found in food
b). Techniques to assess the growth of micro-organisms
c). Nature of useful micro-organisms
d). Techniques to identify the micro-organisms

The basic knowledge and skills about these aspects are essential to understand others subject areas and for the application of microbiological considerations required in the food preservation and processing technology.

COURSE CONTENTS:

1. Introduction (20hrs)

1.1. Classification of living system: Whittaker's five Kingdom concepts.
1.2. Definition of Microbiology.
1.3. Historical Developments in Microbiology.
1.4. Classification of microorganisms (Unicellular, Multicellular, Prokaryotes, Eukaryotes).
1.5. Cell and cell organelles (including ribosome's, mitochondria, endoplasmic reticulum, vacuoles etc.) – their functions

2. Pure culture: (15hrs)

2.1. Streak plating, pour plating, spread plating, serial dilution technique.

3. Microbial Growth: (12hrs)

3.1. Growth curve and its different phases, factors affecting microbial growth.

4. Bacteria: (20hrs)

4.1. Structure size and shape.
4.2. Types depending upon different requirements.
4.3. Gram positive and negative bacteria.
4.4. Mode of reproduction.

5. **Fungi: (13hrs)**

5.1. Yeast and moulds- Structure: their growth requirements,
5.2. Mode of reproduction, its importance

COURSE OUTCOMES

After the completion of the course the student will be able to:

Unit 1:

- Comprehend & Analyze the concept of cell & its organelles and the living systems

Unit 2:

- Learn the concept of various plating & preservation techniques of microbial cultures

Unit 3:

- Gain knowledge of microbial growth along with its phases

Unit 4:

- Comprehend & Analyze the complete bacterial cell structure and various types of bacteria

Unit 5:

- Determine the structure, growth & reproduction of fungi & its types.

Note: -

Teachers should make use of charts and other appropriate media to support classroom instruction. Emphasis during the practical session should be on performance by individual students and teacher should develop instructional manual for various exercises to facilitate the students. Visits to some of the local industries and quality control canters may be arranged to demonstrate various aspects of basic microbiology to the students. Experts may be invited to deliver lectures on latest developments in the field.

RECOMMENDED BOOKS:

1. Essentials of Microbiology by K.S. Bilgrami, CBS
2. Food Microbiology by W.C. Frazier: Tata McGraw Hill
3. Modern Food Microbiology by James M. Jay; CBS
4. Bacteriology by Salle
5. Basic Food Microbiology; Bannett Chapmen and Hall
6. Standard Methods for Waste Water Analysis – American Public Health Association (APHA)

UNIT WISE TIME AND MARKS DISTRIBUTION

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	12	25
2	09	19
3	07	15
4	12	25
5	08	16
Total	**48**	**100**

PROGRAM: THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC202**	Course Title: **BASIC MICROBIOLOGY LAB**
Semester: **2nd**	Credit: **1**
Periods Per Week: **2 (L: 0 T: 0 P: 2)**	

COURSE OBJECTIVE

The main objectives of this subject are to develop knowledge and skills in the students in the following major areas:

a). The nature of micro-organisms found in food
b). Techniques to assess the growth of micro-organisms
c). Nature of useful micro-organisms
d). Techniques to identify the micro-organisms

The basic knowledge and skills about these aspects are essential to understand others subject areas and for the application of microbiological considerations required in the food preservation and processing technology.

LIST OF PRACTICALS:-

1. Study of microscope
2. Study of bacteria, yeast &moulds under Microscope.
3. Size determination of microorganisms under microscope
4. Media preparation for fungi & bacteria
5. Preparation of glass wares for sterilization
6. Methods of sterilization-dry heat and moist heat
7. Enumeration of bacteria in the media by pour plating, spread plating and streaking techniques
8. Gram staining of bacteria

PROGRAM THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC203**	Course Title: **TECHNOLOGY OF FRUIT AND VEGETABLES**
Semester:**2nd**	Credit: **3**
Periods Per Week: **3 (L: 3 T: 0 P: 0)**	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding in processing techniques and skills in handling equipment/machines used for preservation and value addition of perishables like fruits and vegetables

COURSE CONTENTS:

Unit 1: Introduction: (02hrs)
- Status and scope of fruits and vegetables industry in India.
- Classification, composition and nutritive value of fruits and vegetables

Unit 2: Preparatory Operations and Related Equipment: (04hrs)
- Cleaning, sorting, grading, peeling and blanching methods

Unit 3: Ingredients and processes for the manufacture (10hrs)
- Jam, jellies, marmalade, preserves
- Pickles and chutneys
- Defects and factors affecting the quality of above

Unit 4: Tomato Products: (10hrs)
- Ingredients and their role,
- Process for the manufacture of tomato ketchup, sauce, puree and paste.

Unit 5: Juices: (10hrs)
- Raw materials, extraction, classification, processing and aseptic packaging

Unit 6: Thermal processing of fruits and vegetables (05hrs)
- Definition , various techniques of thermal processing and their effects on the quality of fruits and vegetable products,
- Types of containers and their selection , spoilage of canned foods

Unit 7: Dehydration of Fruits & Vegetables (04hrs)
- Dehydration of Fruits: equipment and process for dehydration of plums, apricot, apple, fig, grapes peach etc:
- Dehydration of Vegetables: equipment and process for dehydration of peas, cauliflower, potato, methi, mushroom, tomato etc . Dehydration of different fruits.
- Osmo-dehydration – basic concept.

Unit 8: Freezing : (03hrs)

- Freezing process of different fruits and vegetables. Changes during freezing.

INSTRUCTIONAL STRATEGY:

This being one of the most important subjects, teacher should lay emphasis on developing basic understanding of various concepts and principles and procedures involved herein. Suitable tutorial exercises may be designed by the teachers, which require students visit to various industries. Students may also be exposed to various National and international standards. Visits to the relevant industry for demonstrating various operations involved in fruits and vegetables processing, is a must. Experts from the industry may be invited to deliver lectures on the latest technology. Knowledge about pollution control and devices for the same may be provided to the students. Wherever relevant, students may be made aware about safety aspects.

COURSE OUTCOMES

After the completion of the course the student will be able to:

- Explain the classification and composition of fruits and vegetables
- Analyze the Unit operations of fruit and vegetable technology
- Prepare & analyze the manufacturing process of fruit and vegetables products
- Prepare & analyze the Manufacturing process of Tomato products
- Prepare & analyze the Manufacturing process of various Juices
- Determine thermal techniques and their effect on fruit and vegetable products.
- Determine the procedure of Dehydration of fruits and vegetables
- Determine the Freezing process of fruits and vegetables.

RECOMMENDED BOOKS

1. Fruits and Vegetable Preservation by Girdhari Lal and Sidappa; ICAR (New Delhi)
2. Preservation of Fruits and Vegetable by Srivastava; IBD Co., Lucknow
3. Preservation of Fruits and Vegetable by VijayaKhader; Kalyani Publication
4. Post Harvest Technology of Fruits and Vegetables – Handling, Processing, Fermentation and Waste Management by LR Verma and VK Joshi
5. Processing Fruits: Science & Technology vol 1-2 by Somogyi
6. Processing Vegetables: Science & Technology vol 1-2 by Somogyi
7. The Technology of Food Preservation by Desrosier
8. Food Science by Potter
9. Food Science by Mudambi

UNIT WISE TIME AND MARKS DISTRIBUTION

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	05
2	04	09
3	10	19
4	10	19
5	10	19
6	05	12
7	04	09
8	03	08
Total	**48**	**100**

PROGRAM THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC204**	Course Title: **TECHNOLOGY OF FRUIT AND VEGETABLES LAB**
Semester:**2nd**	Credit: **1**
Periods Per Week: **2 (L: 0 T: 0 P: 2)**	

COURSE OBJECTIVE:

This subject is aimed to develop an understanding in processing techniques and skills in handling equipment/machines used for preservation and value addition of perishables like fruits and vegetables

LIST OF PRACTICALS:

1. Preparation of Jam, jelly and preserve
2. Preparation of pickle by various methods
3. Preparation of chutney
4. Extraction of tomato juice by hot and cold break methods
5. Preparation of tomato sauce/ketchup
6. Preparation of tomato puree/paste
7. Extraction of juice by various methods
8. Bottling and processing of fruit juice
9. Preparation of syrup and brine solutions
10. Dehydration of peas, potatoes
11. Dehydration of grapes and apples
12. Freezing of peas
13. Visits to different fruit and vegetable processing industries

PROGRAM: THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC205**	Course Title: **FOOD CHEMESTRY & NUTRITION**
Semester:**2ND**	Credit: **2**
Periods Per Week: **2 (L: 2 T: 0 P: 0)**	

COURSE OBJECTIVE:

Diploma holders in food technology are required to test the food products in the laboratories and should have theoretical as well as practical understanding of food chemistry and nutrition, which relates to different aspects of food chemistry and nutrients such as water, carbohydrates, fats, protein, minerals, vitamins, food pigments, enzymes etc. Hence the subject is included for developing these competencies.

COURSE CONTENT:

Unit 1: FOOD AND FOOD GROUPS: (03hrs)
Definition and functions of food. Introduction to food groups. Scope of food chemistry.

Unit 2: Water : (03hrs)
Structure of water molecule, types and properties of water, water activity and its importance

Unit 3: Carbohydrates: (05hrs)
Basic composition, classification, sources and importance.

Unit 4: Proteins : (04hrs)
Basic composition, classification, sources and importance.

Unit 5: Fats: (05hrs)
Basic composition, classification, sources and importance.

Unit 6: Minerals & Vitamins: (04hrs)
Functions and sources of minerals-calcium, iodine, zinc, iron.
Functions and sources of fat soluble and water soluble vitamins

Unit 7: Food Pigments: (04hrs)
Importance and plant sources of pigments (Chlorophyll, Anthocyanin, carotenoids, lycopene)

Unit 8: Enzymes: (04hrs)
Definitions, mode of action, importance sources and classification

COURSE OUTCOMES

After the completion of the course the student will be able to:

- Explain the importance and scope of food chemistry
- Determine the concept of water and water activity
- Analyze & examine the concept of carbohydrates, structure and importance of carbohydrates
- Analyze & examine the concept, structure and importance of proteins
- Analyze & examine the concept, structure and importance of Fats
- Analyze & examine the concept of minerals and Vitamins
- Analyze & Examine the concept of Food Pigments.
- Analyze & Examine the concept of Enzymes

INSTRUCTIONAL STRATEGY:-

This is one of the basic subjects for the diploma holders in food technology. Teacher should design appropriate tutorial exercises for the students. Students may be given sufficient practice on different experiments, individually, under the guidance of teacher. Teachers may also prepare charts and slides. Student may be taken to industry for showing different tests.

RECOMMENDED BOOKS:

1. Essentials of Food and Nutrition by Swaminathan Vol. I and II, Health Kalyani publishers, New Delhi
2. Food Chemistry by LH Meyer, Van Nostrand Reinhold Co. New York ...
3. Hand book of Analysis of Fruits and Vegetables by S. Ranganna, Tata Me GrawHill. Publishing Company, New Delhi
4. Biochemistry by Mohinder Singh, Sejwal Publisher. New Delhi
5. Introduction to Biochemistry by Braverman, Elsevier Scientific Publishing
6. Food Chemistry by Linhinger, CBS Publishers, Delhi ...
7. Food Chemistry by FANNEMA,

UNIT WISE TIME AND MARKS DISTRIBUTION

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	09
2	03	11
3	05	16
4	04	11
5	05	16
6	04	13
7	04	11
8	04	13
TOTAL	**32**	**100**

PROGRAM: THREE YEAR DIPLOMA IN FOOD TECHNOLOGY	
Course Code: **FTPC206**	Course Title: **FOOD CHEMESTRY & NUTRITION LAB**
Semester:**2ND**	Credit: **2**
Periods Per Week: **4 (L: 0 T: 0 P: 4)**	

COURSE OBJECTIVE:

Diploma holders in food technology are required to test the food products in the laboratories and should have theoretical as well as practical understanding of food chemistry and nutrition, which relates to different aspects of food chemistry and nutrients such as water, carbohydrates, fats, protein, minerals, vitamins, food pigments, enzymes etc. Hence the subject is included for developing these competencies.

LIST OF PRACTICALS:

1. Determination of moisture in a given food sample.
2. Determination of protein in a given food sample.
3. Determination of carbohydrates in a given food sample.
4. Determination of ash in a given food sample.
5. Determination of crude fat in a given food sample.
6. Determination of pH of a given sample.
7. Determination of acidity of given food sample/beverage.
8. Determination of total non reducing and reducing sugars
9. Identification of pigments in a given food sample
10. Visit to hospital/slide show on various nutritional deficiency disorder