Sant Gadge Baba Amravati University, Amravati

Faculty: Science and Technology

Programme: B.Sc. Food Processing & Technology

POs:
Students of undergraduate general degree programme at the time of graduation will be able to –

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, check out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest contexts socio-technological changes.

PSOs:
Upon completion of the programme successfully, Student would be able to

1. Use the source and variability of raw food material and their impact on food processing operations.
2. Explain the spoilage and deterioration mechanisms in foods and apply methods to control deterioration and spoilage.
3. List the principles that make a food product safe for consumption.
4. apply the unit operations required to produce a given food product.

Employability Potential of the Programme:

Student opting for B. Sc. Food science subject have opportunities in the field of food and nutrition as well as technology. Some of the avenues are listed below,

1. Teaching: Teaching profession can be chosen in the colleges and other institutions offering the courses related to food science, nutrition, catering and hotel management as well as nursing
2. In food Industries: As shift supervisors, production officers/ managers, quality control analyst, research scientist, purchasing, and marketing personals
3. In hospitals: As dietitians
4. In Government sectors: Food analysts (Food and Drugs)
5. In hotel industries: Chef, supervisors
6. Entrepreneurship: There is huge market of food and food products. Many food manufacturing units can be started in low investment as compared to other industries. So By completing these subjects they can start production of many products such as fruits candies, squash, juices, jams, jelly, ketchup, pickles, canned vegetables, bakery and confectionaries, spices, Indian snacks (Farsan, chevda, shev, chakli, etc.), potato, banana chips, milk and milk products, etc.

Syllabus Prescribed for B.Sc. I Year UG ProgrammeProgramme: B.Sc.
Food Processing & Technology
Semester 1

Code of the Course/Subject	**Title of the Course/Subject**	**(Total Number of Periods)**
DSC/FPT-1	Principals of Food Processing - I	**72**

COs

On successful completion of this course, the students would be able to

1. Process milk to produce all types of dairy products
2. Handle dairy equipment and machineries while maintaining process parameters
3. Plan production sequence as per production order
4. Observe food safety and hygiene standards at work
5. Prepare and process various fruits and vegetables manually or in machine operated units for drying/dehydration;
6. Plan, organize, prioritize, inspect, and calculate production requirements;
7. Maintain process parameters to achieve the desired quality and quantity;

Unit	Content
Unit I	**Preservation Techniques** Classification of food; Constituents of foods Food preservation; Food Preservation and Processing: Principles and Methods of food preservation, High Temperature Preservation: Introduction; Blanching; Pasteurization; Sterilization; **12 (periods)**
Unit II	**Food Preservation Techniques** Food preservation; Food Preservation and Processing: Principles and Methods of food preservation, High Temperature Preservation: Introduction; Blanching; Pasteurization; Sterilization; **(12 Periods)**
Unit III	**Cereals, millets & pulses:** • Introduction, types, composition (important nutrients), general structure, names, identification of cereals in some important languages (scientific, English, Marathi, and Hindi) • Wheat- structure, composition, types (Hard, soft, strong, weak) Rice – structure, composition, types • Pulses- Introduction, types, structure and composition, names and identification of cereals in Indian languages, toxic constituents in pulses, soaking, germination and decortications of pulses Malting of cereals and legumes- Definition and nutritional advantages; **12 (periods)**
Unit IV	**Fruits & vegetables:** • Post-harvest changes, ripening of fruits and vegetables; chemical ripening of fruits and effects of chemicals on health • Theory Production and processing scenario of fruits and vegetables in India and World. • Overview of principles and preservation methods of fruits and vegetables. • Commercial processing technology of fruits and vegetables, Primary processing and pack house handling of fruits and vegetables; • Peeling, slicing, cubing, cutting and other size reduction operations for fruits and vegetables, Blanching operations and equipment, Canning: Definition, processing steps, and equipment, cans and containers, quality assurance and defects in canned products, Preparation and preservation of juices, squashes, syrups, sherbets, nectars, cordials, etc; Problems on squash and RTS **12 (periods)**
Unit V	**Milk & their products:** Introduction, composition. Types of milk: whole milk, skimmed milk, semi-skimmed milk, condensed milk, fortified milk, low fat milk, evaporated milk, dried milk, toned milk. Fermentation of milk into various products - curd, butter, ghee, butter-milk, paneer, yogurt, and cheese **(12 periods)**
Unit VI	***SEM** Processing of fruits and vegetables to produce squash and juice manually or mechanically Plan, organize, prioritize, inspect, and calculate production requirements and maintain process parameters to achieve the desired quality and quantity Maintain process parameters to attain the desired quality and quantity Follow and maintain food safety and hygiene in the work environment **(12 periods)**

COs: 1. Process fruits and vegetables to produce squash and juice manually or mechanically 2. Plan, organize, prioritize, inspect, and calculate production requirements and maintain process parameters to achieve the desired quality and quantity 3. Maintain process parameters to attain the desired quality and quantity 4. Follow and maintain food safety and hygiene in the work environment	
**Activities	1. Demonstration of various machineries used in processing 2. Preparation of various fruit products 3. Preparation of various dairy products

Course Material/Learning Resources

Text books & Reference Books:

1. A Handbook on Post harvest Management of Fruits and Vegetables P. Jacob John Daya Publishing House, Delhi ISBN: 9788170355328
2. Postharvest: An introduction to the physiology and handling of fruit and vegetables, 6th edition Wills R. and Golding J. UNSW Press ISBN: 9781742247854
3. Post-harvest Technology of Fruits and Vegetables – Vol. 1 Verma L. R. and Joshi V. K. Indus Publishing Company, Delhi ISBN: 8173871086
4. Handbook of Analysis and Quality Control for Fruits and Vegetable Products Ranganna S. 2 nd Edition, Tata-McGraw Hill, 2001
5. Preservation of fruits and vegetables Girdhari Lal, Siddappa, ICAR

Syllabus Prescribed for B.Sc. I Year UG Programme
Programme: Semester 1

Code of the Course/Subject	Title of the Course/Subject	(No. of Periods/Week)
FPT-1/ Principals of Food Processing	FPT Lab -1	60

COs

On successful completion of this practical course, the students would be able to

1. List out, identify and handle various equipment used in processing.
2. Learn the procedures of operation of various processing equipment.
3. Acquire skills in observing and measuring different physicochemical parameters.
4. Conduct processing practicals collaboratively and ethically.

*** List of Practical/Laboratory Experiments/Activities etc.**

It is necessary to perform **TEN** Experiments from the list given below.

1	Demonstration of various machineries used in processing
2	Demonstration of effect of blanching on food quality characteristics
3	Preservation using heat
4	Preservation by low temperature
5	Preparation of Jam
6	Preparation of Jelly
7	Preparation of Marmalade
8	Preparation of Sugar Syrup
9	Preservation by using salt (pickling)
10	Preservation by using chemical preservatives (sodium benzoate, calcium propionate)
11	Judging and grading of milk & milk products
12	Preparation of Dahi
13	Preparation of Yogurt
14	Preparation of Shrikhand

*** Total number of Practical/Lab Experiments/Activities, etc. may be decided by the respective BOS.**

BOS should meticulously choose the type of activity according to the need of their Course

Course Material/Learning Resources

Text books & Reference Books:

6. Handbook of Analysis and Quality Control for Fruits and Vegetable Products Ranganna S. 2 nd Edition, Tata-McGraw Hill, 2001
7. A Practical Hand Book of Food and Nutrition, Dr Jayashree Mishra and Dr Pravabati Guru, 4648/21, Ansari Road, New Delhi, Shivalik Prakashan ISBN : 9789387195660

Weblink to Equivalent MOOC on SWAYAM if relevant:

https://nptel.ac.in

Weblink to Equivalent Virtual Lab if relevant:

https://vlab.amrita.edu/ https://www.vlab.co.in/

http://vlabs.iitb.ac.in/v‚lab/labsps.html

Any pertinent media (recorded lectures, YouTube, etc.) if relevant:

Faculty: Science and Technology
Programme: B.Sc. Food Processing & Technology

Syllabus Prescribed for B.Sc. I Year UG Programme

Programme: B.Sc. Food Processing & Technology
Semester 2

Code of the Course/Subject	**Title of the Course/Subject**	**(Total Number of Periods)**
DSC/FPT-2	Principles of Food Processing-II	**72**

COs

On successful completion of this course, the students would be able to

1. Process fruits to preserve its quality
2. Handle canning equipment and machineries while maintaining process parameters
3. Plan production sequence as per canning production order
4. Observe food safety and hygiene standards at work
5. Prepare and process various fruits and vegetables manually or in machine operated units for drying/dehydration;
6. Plan, organize, prioritize, inspect, and calculate production requirements;
7. Maintain process parameters to achieve the desired quality and quantity;

Unit	**Content**
Unit I	**Canning** Canning: Introduction, principle & Methods Concentration- Methods of concentration, Changes; Effect of drying, dehydration and concentration on quality of foods, **12 (periods)**
Unit II	**Drying** Drying, Dehydration and Concentration: Water activity and relative humidity; Factors affecting rate of drying and dehydration; Drying methods; Changes during drying and dehydration; different Driers; (12 Periods)
Unit III	**Harvesting of fruits & vegetables** Harvesting of fruits & vegetables: Introduction; definition; different methods of harvesting; factors during harvest affecting quality of produce; post-harvest handling: Introduction; postharvest handling **12 (periods)**

Unit IV	**Preservation by Natural agents:** Preservation using Sugar, Salt and Acids: Sugar – Introduction, Factors affecting osmotic pressure of sugar solution, Foods preserved using sugar; Salt: Introduction, Antimicrobial activity of salt, Estimation of salt, Food products preserved using salt; **12 (periods)**
Unit V	**Preservation by Chemical agents:** Common foods preserved using acids, Preservation by Use of Chemical preservatives: Introduction; Objectives; Factors affecting antimicrobial activity of preservatives; Type of chemical preservatives; Sulphur dioxide, Benzoic acid, etc.; Use of other chemicals like acidulants, antioxidants, mold inhibitors, antibiotics. **(12 periods)**
Unit VI	***SEM** Define fruit ripening • Classify fruits as per ripening • State various methods of fruit ripening • State the process of ripening of fruits • Explain the layout of fruit ripening chamber • Identify the different equipment, tools and machineries used for processing • Explain the operation of the ripening chamber • State the materials and equipment used in cleaning and maintenance of the work area and machineries • State the cleaning processes used to clean the work area • Demonstrate the use of different tools and machineries used for fruit ripening • Identify the appropriate method for cleaning and maintaining a work area **(12 periods)**
COs:	1. Ripen food products in a ripening chamber; 2. Follow and maintain cleanliness, hygiene and safety of the ripening Chamber 3. Plan, organize, prioritize, inspect, and calculate production requirements 4. Maintain process parameters to achieve the desired quality; 5. Follow and maintain food safety and hygiene in the work environment
**Activities	4. Demonstration of various machineries used in processing 5. Preservation of fruits and vegetables by natural agents 6. Preservation of fruits and vegetables by chemical agents 7. Harvesting of fruits and vegetables 8. Canning of fruit products

Course Material/Learning Resources

Text books & Reference Books:

8. A Handbook on Post harvest Management of Fruits and Vegetables P. Jacob John Daya Publishing House, Delhi ISBN: 9788170355328
9. Postharvest: An introduction to the physiology and handling of fruit and vegetables, 6th edition Wills R. and Golding J. UNSW Press ISBN: 9781742247854
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Syllabus Prescribed for B.Sc. I Year UG

Programme

Programme: Semester 2

Code of the Course/Subject	Title of the Course/Subject	(No. of Periods/Week)
FPT-2/ Principals of Food Processing	FPT Lab -2	6

COs

On successful completion of this practical course, the students would be able to

1. List out, identify and handle various equipment used in processing.
2. Learn the procedures of operation of various processing equipment.
3. Acquire skills in observing and measuring different physicochemical parameters.
4. Conduct processing practicals collaboratively and ethically.

*** List of Practical/Laboratory Experiments/Activities etc.**

It is necessary to perform **TEN** Experiments from the list given below.

1	Preservation by using salt (pickling)
2	. Preservation by using chemical preservatives (sodium benzoate, calcium propionate)
3	Drying and dehydration of fruit
4	Drying and dehydration of vegetables
5	Reconstitution test for fruits and vegetables
6	Preservation of coconut shreds using humectants
7	Osmotic dehydration of Amla, carrot
8	Ripening of banana using ethrel
9	Effect of storage transpiration rate of fruit
10	Packaging of fruits and vegetables
11	Effect of blanching of polyphenol oxidase activity
12	Studies on effect of different storage temperatures on quality of fruits.
13	Wax coating of selected fruits

*** Total number of Practical/Lab Experiments/Activities, etc. may be decided by the respective BOS and BOS should meticulously choose the type of activity according to the need of their Course**

Course Material/Learning Resources

Text books & Reference Books:

1. Handbook of Analysis and Quality Control for Fruits and Vegetable Products Ranganna S. 2 nd Edition, Tata-McGraw Hill, 2001
2. A Practical Hand Book of Food and Nutrition, Dr Jayashree Mishra and Dr Pravabati Guru, 4648/21, Ansari Road, New Delhi, Shivalik Prakashan ISBN : 9789387195660

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http://vlabs.iitb.ac.in/v,,lab/labsps.html

Any pertinent media (recorded lectures, YouTube, etc.) if relevant: