SHIVAJI UNIVERSITY, KOLHAPUR

STRUCTUCTURE AND SYLLABUS OF DIPLOMA IN

FOOD PROCESSING AND PRESERVATION

Under community college

DIPLOMA IN FOOD PROCESSING AND PRESERVATION

TITLE **: Diploma in food processing & preservation.**
Syllabus (semester Pattern)

Under faculty of science

YEAR OF IMPLEMENTATION: Syllabus will implemented from June 2015

DURATION **:** Diploma (one year)

PATTERN OF EXAMINATION : Semester Pattern

- **Theory examination-**At the end of each semester as per Shivaji University Rules
- **Practical Examination-**i) in the 1st Semester of Diploma there will Be internal assessment of practical record, related report submission and project reports at the end of Semester
  ii) In the second semester of Diploma, There will be external practical examination at the end of semester.

MEDIUM OF INTRUCATION : English/Marathi

STRUCTURE OF COURSE : Diploma

Two semesters per Year

Two General papers per year/semester

Three Vocational papers per year/ semester
one industry Visit/Study Tour and on job training

SCHEME OF EXAMINATION

THEORY

- The theory examination shall at the end of the each semester.
- All the general theory papers shall carry 40 marks and all vocational theory papers shall carry 50marks.
- All the general practical shall carry 10 marks and all vocational practical shall carry 50marks
- Evaluation of the performance of the students in theory shall be on the basis of semester examination as mentioned above.

.Nature of question paper for Theory examination (excluding Business communication paper)-

i. There will be seven questions carrying equal marks.
ii. Students will have to solve any five questions.

Q.No.1: Short answer type question with internal choice
(Two out Of Three)
Q.No.2:toQ.No.6: Long answer type questions
Q.No.3: Short Notes with Internal Choice
(Two out three)

B) PRACTICAL

Evaluation of the performance of the students in the practical shall be on the basis of semester examination (Internal assessment at the end of semester –I and external examination at the end of semester –II) as mentioned separately in each paper.

Standard of passing As per the guidelines and rules for Diploma under community college

Structure of the Course

Semester-I

Sr No.	**Paper No.**	**Title**	**Theory**	**Practical/ Project**	**Marks (Total)**	**Distribution of marks**	
						Theory	**Practical**
1.	I	Business communication-I	Theory	Practical	50	40	10
2.	Ii	Fundamental of Food science	Theory	Practical	50	40	10
3.	Iii	Food preservation-I	Theory	Practical	100	50	50
4.	Iv	Agro processing	Theory	Practical	100	50	50
5.	V	Bakery & confectionary	Theory	Practical	100	50	50
6.	Vi	Industrial visit		Practical	50	--	50

Semester-II

Sr. No	**Paper No.**	**Title**	**Theory**	**Practical/ Project**	**Marks (Total)**	**Distribution Of marks**	
						Theory	**Practical**
1.	Vii	Business communication-II	Theory	Practical	50	40	10
2.	Viii	Fundamentals of Nutrition	Theory	Practical	50	40	10
3.	Ix	Food preservation-II	Theory	Practical	100	50	50
4.	X	Food Quality control and Waste Management	Theory	Practical	100	50	50
5.	xi	Milk And milk product processing	Theory	Practical	100	50	50
6.	Xii	On Job Training			50	--	50

Scheme of teaching:

Semester-I

Sr. No	Paper No.	Title	Distribution Of Workload (Per Week)		
			Theory	**Practical**	**Total**
1	I	Business Communication-I	4	2	6
2	II	Fundamentals Of Food Science	4	2	6
3	III	Food Processing-I	4	4	8
4	IV	Agro Processing	4	4	8
5	V	Bakery & Confectionary	4	4	8
6	VI	Industrial visit	-	-	-
		Total--	**20**	**16**	**36**

Semester-II

Sr. No	Paper No.	Title	Distribution of Workload (Per Week)		
			Theory	**Practical**	**Total**
1	VII	Business Communication -II	4	2	6
2	VIII	Fundamentals Of Nutrition	4	2	6
3	IX	Food preservation –II	4	4	8
4	X	Food Quality Control And Waste Management	4	4	8
5	XI	Milk And Milk Product processing	4	4	8
6	XII	On job Training	-	-	-
		Total--	**20**	**16**	**36**

Eligibility for Admission: 10+2from any faculty or equivalent qualification in related stream.

Eligibility for Faculty: M.Sc/M.Tech in Food Science and Technology or Food Science and Quality control or Food and Nutrition with Ph.D/NET/SET.

Eligibility for Lab Assistant : B.Sc/B.Tech in Food Science and Technology or Food Science and Quality control or Food and Nutrition

CREDIT SYSTEM

DIPLOMA IN FOOD PROCESSING & PRESERVATION.

Subject wise credit assignment for diploma in Food Processing & preservation

(Semester-I)

Sr. no	Paper No.	Title	Theory/ Practical/Project	Mark (Total)	Distribution Of Marks		Credits	
					Theory	Practical	Theory	Practical
1	I	Business Communication-I	Theory& practical	50	40	10	3	2
2	II	Fundamentals Of Food Science	Theory & Practical	50	40	10	3	2
3	III	Food Preservation - I	Theory& Practical	100	50	50	3	3
4	IV	Agro Processing	Theory & Practical	100	50	50	3	3
5	V	Bakery & Confectionary	Theory& Practical	100	50	50	3	3
6	VI	Industrial Visit	Practical	50	---	50	---	2

Subject wise credit assignment for diploma in Food Processing & preservation.

(Semester-II)

Sr. No	Paper No.	Title	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	VII	Business Communication-II	Theory& Practical	50	40	10	3	2
2	VIII	Fundamentals Of Nutrition	Theory& Practical	50	40	10	3	2
3	IX	Food Preservation -II	Theory& practical	100	50	50	3	3
4	X	Food Quality Control and Waste Management	Theory& practical	100	50	50	3	3
5	XI	Milk and Milk product processing	Theory& practical	100	50	50	3	3
6	XIII	On job Training	practical	50	---	50	---	2

Evaluation system:

Standard of passing

The maximum credits for Diploma in Food processing semester course (of two semesters) will be 30X2=60 credits. To pass in each paper students are required to obtain 4 grade points in each paper. It means 18marks for 50marks Theory/practical papar, 14.08for 40 marks Theory papers and 04 marks for 10 Marks practical papers.

2. Assessment of project/Industrial visit /study tour/ internship Report

i) The Industrial visit/study tour / on job training report must be submitted by the prescribed date usually two week before the end of academic session of the semester

ii) It is desirable that the topics for Industrial Visit/study tour/on-job training report shall be assigned by the end of previous semester.

iii) The industrial Visit/study tour/ on-job training report and its presentation shall be evaluated by the coordinator of the course and concerned faculty.

3. Grade point for Theory/practical/Industrial visit/study tour/on job training Report

- **Table –I: for 50 Marks Theory or practical**

Grade point	Marks out of	Marks Obtained	Grade	Description of performance
0.00	50	0.0 to 2.5	D	Unsatisfactory
1	50	2.06 to 5.0		
1.5	50	5.1 to 7.5		
2	50	7.6 to 10.0		
2.5	50	10.1 to 12.5		
3	50	12.6 to 15.0		
3.5	50	15.1 to17.5		
4	50	17.6 to20.0	C	Fair
4.5	50	20.1 to22.5		
5	50	22.6 to 25.0	B	Satisfactory
5.5	50	25.1 to 27.5		
6	50	27.6 to 30.0	B+	Good
6.5	50	30.1 to 32.5		
7	50	32.6 to 35.0	A	Very Good
7.5	50	35.1 to37.5		
8	50	37.6 to 40.0	A+	Excellent
8.5	50	40.1 to 42.5		
9	50	42.6 to 45.0	O	Outstanding
9.5	50	45.1 to 47.5		
10	50	47.6 to 50.0		

- **Table –II: for 40 Marks Theory or practical**

Grade point	Marks out of	Marks Obtained	Grade	Description of performance
0.00	40	0.0 to 2.0	D	Unsatisfactory
1	40	2.08 to 4.0		
1.5	40	4.08 to 6.0		
2	40	6.08 to 8.0		
2.5	40	8.08 to 10.0		
3	40	10.08 to12.0		
3.5	40	12.08 To14.0		
4	40	14.08 to16.0	C	Fair
4.5	40	16.08 to18.0		
5	40	18.08to 20.0	B	Satisfactory
5.5	40	20.08 to 22.0		
6	40	22.08 to 24.0	B+	Good
6.5	40	24.08 to 26.0		
7	40	26.08 to 28.0	A	Very Good
7.5	40	28.08 to30.0		
8	40	30.08 to 32.0	A+	Excellent
8.5	40	32.08 to 34.0		
9	40	34.08 to 36.0	O	Outstanding
9.5	40	36.08 to 38.0		
10	40	38.08 to 40.0		

.**Table No –III: for 10 Marks practical**

Grade point	Marks out of	Marks obtained	Grade	Description of performance
0.00	10	0.0 to 0.5	D	Unsatisfactory
1	10	0.52 to 1.0		
1.5	10	1.02 to 1.5		
2	10	1.52 to 2.0		
2.5	10	2.02 to2.5		
3	10	2.52 to 3.0		
3.5	10	3.02 to 3.5		
4	10	3.52 to 4.0	C	Fair
4.5	10	4.02 to 4.5		
5	10	4.52 to 5.0	B	Satisfactory
5.5	10	5.02 to 5.5		
6	10	5.52 to 6.0	B+	Good
6.5	10	6.02 to 6.5		
7	10	6.52 to 7.0	A	Very Good
7.5	10	7.02 to 7.5		
8	10	7.52 to 8.0	A+	Excellent
8.5	10	8.02 to 8.5		
9	10	8.52 to 9.0	O	Outstanding
9.5	10	9.02 to 9.5		
10	10	9.52 to 10.0		

Calculation of SGPA and CGPA-

1. Semester Grade Point Average (SGPA) ={ (Course credits in passed course grade points)

}(course credit in registered course)

2. Cumulative Grade Point Average = {(course credits in passed course X earned grade points) off all semester

} (course credits in registered course) off all semester

3. At the end of each year of B>VOC >Program, student will be placed in any one of the divisions as detailed below;

SGPA AND CGPA Table

Grade point	Grade	Description of performance
0.00 to 3.49	D	Unsatisfactory
3.5 to 4.49	C	Fair
4.5 to 5.49	B	Satisfactory
5.5 to 5.99	B+	Good
6.0 to 6.99	A	Very Good
7.0 to 8.49	A+	Excellent
8.5 to 10.00	O	outstanding

- I^{st} class with distinction : CGPA > 7.0 and above
- I^{st} class: CGPA > 6.0 and<6.0
- II^{nd} class: CGPA > 5.0 and <6.0
- Pass class : CGPA > 4.0 and < 5.0
- Fail : CGPA<4.0

Diploma in Food Processing and Preservation

Semester I Paper- I

Business Communication – I

Work Load – 6	Total Marks-50
Theory- 4 Lecture/Week	Theory-40
Practical-2 Lectures/Week/batch	Practical-10

Unit 1 USE OF English in Business Environment

-Business Vocabulary: Vocabulary for banking,

-Marking and for maintaining public relations.

-What is sentence?

-Elements of a sentence

-Types of sentence: Simple, Compound, Complex

Unit 2 Writing a Letter of Application and CV/Resume Topics:

-Structure of a letter of application for various posts.

-CV/Resume and its essentials.

Unit 3 Presenting Information / Data

-Presenting information / data using graphics like table,

-Pie charts, tree diagrams, bar diagrams, graphs, flow charts.\

Unit 4 Interview Technique

-Dos and don’ts of an interview.

-Preparing for an interview.

-Presenting documents.

-Language used in an interview.

Recommended Books:

1. Sethi, Anjanee & Bhavana Adhikari . Business Communication, New Delhi: Tata McGrawHill

2. Tickoo,Champa & Jaya Sasikumar. Writing with a Purpose, New York: OUP,1979

3. Sonie Subash C>.Mastering the art of Effective Business Communication. New Delhi:

4. Studant Aid Publication, 2008 Herkar , Praksh : Business Communication. Pune: Mehta Publications, 2007

5. Herekar,Prakash: Principals Of Business Communication Pune: Mehta publication,2003

6.Rai Urmila& S.M.Rai : Business Communication. Mumbai: Himalaya Publishing House

7.Pradhan, N.S. Business Communication. Mumbai: Himalaya Publishing House, 2005.

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Semester I Paper- II

Fundamentals of Food Science

Work Load – 6	Total Marks-50
Theory- 4 Lecture/Week	Theory-40
Practical-2 Lectures/Week/batch	Practical-10

Objectives:

To enable student-

1. To understand the basic concept, functions & classification of food.

Course content:

Unit 1 Introduction to food science

-Concept of food, food science

-Objective of food science

\ -Classification and function of food

-Methods of cooking

Unit 2 Cereals

-Structure, composition and importance of cereal grains

-Types of cereals used in cooking

-Cereal cookery: Gelatinization, Dextrinization and Identify of grains.

-Processed cereals, millets and Ready –To- Eat cereals used in cooking.

Unit 3 Pulses and legumes

-Definition, composition and structure of pulses

-Cooking of legumes and Factors affecting cooking time of pulses and legumes.

-Use of legumes in cookery.

Unit 4 Fruits and vegetables cookery

` -Classification of fruit and vegetables

-Color pigments in fruit and vegetables

-Effect of heat, acids and alkali on fruits and vegetables.

-Changes during cooking and storage.

Practical:

1) Weights and Measures of raw and cooked food

2) Preparation and product by Gelatinization

3) Preparation of product by Dextrinization

4) Preparation of product by Germinated pulse

5) Preparation of product by milled pulses

6) Preparation of product by green leafy vegetable

7) Preparation of product by roots and tuber

8) Preparation of product by fruits

References:

1. B.Shreelaksmi : "Food Science"(Second edition),New Age International ,New Delhi.
2. Swaminathan : " Text Book of Food Science", Vol.1, BAPPCO,Banglore.
3. Devendrakumar Bhatt & Priyanka Tomar : An Introduction to Food Science, Technology & Quality Managemant, Kalyani Publishers.
4. Sumati R. Mudambi : Fundamentals of Food & Nutrition wiley Eastern Ltd, New Delhi.

Scheme of Internal Practical Examination	**10 marks**
1. Submission of record book	5 Marks
2. Viva- Voce	5 Marks

Semester I Paper- III

Food Preservation – I

Work Load – 8 Total Marks-100

Theory- 4 Lecture/Week Theory-50

Practical-4 Lectures/Week/batch Practical-50

Unit 1 Fundamentals of Food Preservation

-Concept

- Importance of food preservation

-Principles of food preservation

-Techniques of food preservation.

Unit 2 Microorganisms in food

-Introduction

-Types of Microorganisms

-Conditions for growth.

-Food spoilage & their control

Unit 3 Preservation by preservatives

-Concept and definition

-Types

-Natural preservatives

-Synthetic preservatives

Unit 4 Irradiation

- Concept, definition

-Principles of irradiation.

- Types

-Application.

Practical:

1) Identification of lab equipment
2) Identification of class I & class II Preservatives.
3) Identification of spoiled food.
4) Preparation of product by using Salt as preservative (any two)
5) Preparation of product by using Sugar as a preservative (any two)
6) Preparation of product by using Oil as preservative (any two).
7) Preparation of product by using Chemical Preservative (any two)
8) Visit to the food preservation unit.
9) Visit to the irradiation unit.

Scheme of practical examination

Internal practical examination		**50 marks**
I)	Preparation of one of the product from above	20 marks
II)	Identification.	10 marks
III)	Submission of practical record book	10 marks
IV)	Viva – Voce	10 marks

Reference :

1. Food Preservation and processing by Kalila, MnoranjanSood, Sangita.
2. Food microbiology by M.R. Adom M.O. Moss.
3. Modern Food Microbiology by James M.
4. Niir Board : Modern Technology of Agro Processing and Agriculture Waste of India Re 2000.

Diploma in Food Processing and preservation

Semester I – Paper – IV

Agro Processing

Work load -8	Total Marks -100
Theory – 4 Lectures/Week	Theory – 50
Practical – 4 Lectures/Week/batch	Practical – 50

Objectives:

To enable students –

1) To understand the processing techniques of agro product
2) To know the use of agro processing equipments.

Course Content:

Unit I **Agro processing industry.**

-Introduction to Agro processing industry.

-Scope and importance of Agro processed products.

-Processing equipments- Floor mill, mini grain mill, Pulverizers, Hammer Mill, Floor separator, Dal mill, Packing and sealing machine, Balance.

Unit – II **Cereal grain processing**

-Different grains suitable for agro processing.

-Primary processing of major cereals

-Milling of cereals-Dry and Wet milling

Unit – III **-Pulses and Legumes processing**

-Principles of pulse milling

-Different methods of Dhal milling

-Milling of major legumes.

Unit IV **-Oil seeds processing**

-Properties and suitability of oil seeds for processing

-Methods of oil seed processing

-Terminologies in oil processing industry

Practical:

1) Physical analysis of grains
2) Flour Analysis
3) Gluten Estimation of Wheat flour
4) Preparation of Cereal flour of different granule size
5) Preparation of cereal flakes
6) Preparation of puffed cereals
7) Preparation of Rassum
8) Preparation of Pulse flour of different granule size
9) Preparation on of soya milk
10) Preparation Flavored Soya milk
11) Visit to mill/cereal/ or pulse or oil processing unit

Scheme of practical examination

Internal practical examination		**50 marks**
V)	Preparation of one of the product from above	20 marks
VI)	Analysis of flour (Any one test)	10 marks
VII)	Submission of practical record book	10 marks
VIII)	Viva – Voce	10 marks

Reference :

1) Kader A A: post harvest technology of horticulture crops.2nd edition, University of California
2) Salukhe D K and kadam S S: handbook of world food legumes, CRC press, Florida
3) Niir Borad : Modern Technology of Agro Processing and Agriculture Weste, Institute of India Re 2000.
4) Salunkh Dk Chavan J K, Adusule R N And Kadam S S : World oilseeds chemistry, Technology and utilization. VNR, NEW YORK

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Semester I – Paper –V

Bakery & Confectionery

Work Load – 8 Total Marks – 100

Theory – 4 Lectures/Week Theory – 50

Practical -4 Lectures/Week/Batch Practical-50

Objective:

To enable students-

1) to develop skill in Bakery & confectionery

Course content:

Unit-I **-Introduction to bakery and confectionery industry**

-Importance of bakery and confectionery in food industry

-Primary processing equipments used in Bakery and confectionery

Flour Mill mixer, moulding machine, balance, packing machines,

Measuring glass, moulds, Knifes, extruder, oven

Unit II **-Bakery Products**

-ingredients used in Bakery products

-Types and quality of flour

-Principles involved in bakery Products

-Procedures of Different types of bakery products

Unit III **-Introduction to confectionary products**

-Types of confectionary Products

-Characteristics of confectionary Products

-Ingredients used in confectionary Products

Unit-IV **-Confectionary Products**

-chocolate Processing

-Boiled sweets

-Gelatine sweet

-Crystallized confectionery

Practical:

1) Introduction to Bakery And Confectionery Equipments
2) Determination of gluten content
3) Preparation of Bread
4) Preparation of Biscuit
5) Preparation of Cookies
6) Preparation of Cake
7) Preparation of Barfi
8) Preparation of Chikki
9) Preparation of Chocolate
10) Preparation of Boiled candy

Scheme of practical examination

Internal practical examination	**50 Marks**
i) Preparation of one of the Product from above	20 Marks
ii) Determination of gluten content	10 Marks
Or	
Identification of bakery and confectionery equipments And its uses (any 5)	
Submission of practical record book	10Marks
iii) Viva-voce	10 Marks

Reference:

i) John Kingslee: A professional text bakery and confectionery, New Age International Publication.

ii) NIIR Borad ; the complete technology book on bakery products

iii) W.P Edwards: Science of Bakery Products.

iv) Emmanueal obene : Chocolate Science and Technology

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Semester II Paper- II

English Communication – II

Work Load – 6	Total Marks-50
Theory- 4 Lecture/Week	Theory-40
Practical-2 Lectures/Week/batch	Practical-10

Unit 1 Group Discussion

-Preparing for a Group Discussion, Initiating a Discussion, Eliciting Opinions, Views, etc, Expressing Agreement / Disagreement, Making Suggestions: Accepting and declining suggestions. Summing up.

Unit 2 Business Correspondence

Writing Memos, e-mails, Complaints, Inquiries, etc. Inviting Quotations, Placing Orders, Tenders, etc.

Unit 3 English for Negotiation

Business Negotiation, Agenda for Negotiation. Stages of Negotiation.

Unit 4 English for Marketing

Describing/ Explaining a product/ Service, Promotion of a product dealing bargaining with Customers, marking a product/Service: Using Pamphlets, Hoardings, Advertisement, Public Function / Festival.

Recommended Books:

1. Herekar, Praksh. *Business communication* .Pune ; Mehta Publications,2007.
2. Herkar, praksh. *Principals of Business Communication.* Pune : MehtaPublicaation,2003
3. John, David. Group Discussions. New Delhi: Arihant Publication
4. Kumar, Varinder. *Business communication.* New Delhi: Kalyani Publishers, 2000.
5. Pardeshi, P.C. *Managererial communication,* Pune : NiraliPrakashn,2008
6. Pradhan, N.S *Business communication* Mumbai: Himalaya Publishing House 2005
7. Rai , Urmial& S.M Rai *Business Communication.* Mumbai: Himalaya Publishing House, 2007
8. Sethi, Anjanee & BhavanaAdhikari. *Business Communication.* New Delhi: Tata McGraw
9. Sonie, Subhash C.*Mastering the art of Effective Business communication.* New Delhi; Studant Aid publication, 2008
10. Tickoo, Champa & Jaya Sasikumar. *Writing With a Purpose.* New York: OUP, 1979.
11. Whitehead, Jeoffrey & David H. Whitehead. *Business correspondence.* Allahabad: Wheeler Publlishing,1996.

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Semester II-Paper-VIII

Fundamentals of Nutrition

Work Load-6	Total Marks-50
Theory-4 Lectures/Week	Theory-40
Practical-2 Lectures/Week/Batch	Practical-10

Objectives:

To enable students –
1.To understand the concept of nutrients and nutrition.
2.To study the role of various nutrients.

Course content:

Unit-I **- Introduction to Nutrition**

-Definition of nutrition, nutrients, RDA

-Classification of nutrients (Macro, Micro)

Unit-II **-Macro nutrients (Carbohydrates, Proteins, fats)**

-Classification, Sources

-Functions, RDA

-Deficiency, excess

Unit-III **-Micro nutrients (Vitamins, Minerals)**

-Classification, Sources

-Functions, RDA

-Deficiency, excess

Unit-IV **-Water and Fibre**

-Composition, Sources, Classification

-Functions, RDA

-Deficiency, excess

Practical:

1) Preparation of list of nutrient rich food sources (carbohydrates, proteins, fats)
2) Calculation of nutritive value of food
3) Preparation of high carbohydrate product from cereals with calculation of nutritive value
4) Preparation of high fiber products with calculation of nutritive value
5) Preparation of high protein product from plant source with calculation of nutritive value
6) Preparation of high protein product from animal source with calculation of nutritive value
7) Preparation of high fat product with calculation of nutritive value
8) Preparation of low fat product with calculation of nutritive value
9) Preparation of iron rich product with calculation of nutritive value
10) Preparation of calcium rich product with calculation of nutritive value
11) Preparation of vitamin B1,B2,B3 rich product with calculation of nutritive value

Scheme of External Practical Examination: **10 Marks**

1) Submission of Record book 5 Marks
2) Viva – Voce 5 Marks

References:

1. Shubhangini Joshi, Text book of food and nutrition, Tata Macgrohill Publishing Co.,New Delhi.
2. B.Shrilakshmi, nutrition Science, New Age International Publishers
3. Muddambi S.R and Rajgopal M.V., Fundamentals of Food and nutrition,Wiley Eastern Ltd., New Delhi.
4. Nutritive Value of Indian Foods ,NIN, Hyderabad.
5. Dietary guidelines for Indians ,NIN Hyderabad June 2014.

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Diploma in Food Processing and Preservation

Semester II Paper- III

Food Preservation – II

Work Load – 8 Total Marks-100

Theory- 4 Lecture/Week Theory-50

Practical-4 Lectures/Week/batch Practical-50

Objectives:

To enable student-

1) To acquire Knowledge of food preservation.
2) To acquire Knowledge of preservation techniques

Course Content:

Unit I **-Preservation by drying**

-Concept, history

-Types of drying and dryers.

-Treatments prior to drying

Unit II **-Preservation by use of high temperature.**

-Concept and importance

-Various methods used-pasteurization, Boiling, Canning

-Effect of high temperature on food.

Unit III **-Preservation by Low Temperature**

-Concept, History

-Types of Preservation methods by low temperature

-Different equipments used for preservation by low temperature

-Treatments Prior to freezing

Unit IV **-Modern techniques in food preservation.**

-Concept, Definition

-High Hydrostatic pressure

-Hurdle technology

-Pulse electric field.

Practical-

1) Introduction to drying equipment.
2) Drying of fruits (any two)
3) Drying of Vegetable (any two)
4) Drying of seeds (any two)
5) Blanching of Vegetables.
6) Steaming of Vegetables.
7) Preservation of fruits by Syruping.
8) Introduction of freezing equipment
9) Freezing of fruits (any two)
10) Visit to cold storage unit.
11) Visit to observe modern techniques of food preservation / drying unit.

Scheme of practical examination

Internal practical examination **50 marks**

1) Preparation of one of the product from above 20 marks
2) Identification of equipments and its principle 10marks
3) Submission of practical record book 10 marks
4) Viva – Voce 10marks

References:

1) Prakash Triveni : Food Preservation, Aadi publication, Delhi.
2) M . Shafiur Rahman : Hard Book Of Food Preservation, Marcel Dekker Inc, New York.
3) McWillims and Paine : Modern Food Preservation , Surjeet Publication.
4) Fellows, P and Ellis H. 1990 Food Processing Technology: Principal and Practicals, New York.
5) NPCS Board, Modern Technology on Food Preservation
6) B. Sivasankar; Food Processing and Preservation

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Semester II- Paper-IX

Milk and Milk Product processing

Work load – 8	Total Marks-100
Theory-4 Lecture/Week	Theory-50
Practical – 4 Lectures/Week/Batch	Practical-50

Objectives:

To enable students –

1.To understand techniques on Milk and Milk processing

2.To study the working of equipments used in Milk and Milk product Processing

Course content:

Unit – I **-Introduction to Milk and Milk Products**

-Definition, Production and Processing status of Milk

-Physico-chemical Properties

-composition and nutritive Value

Unit – II **-Processing of milk**

-Pasteurization

-sterilization

-Dehydration

Unit III **Special Milks**

-Re-constituents or Re-hydrated milk

-Condensed milk, Toned milk and Flavored milk

-UHT Milk

Unit – IV **- Milk Products**

-Dahi , Chakka, Shrikhand

-Butter ,Butter Milk, Butter oil, Lassi

-Channa, Paneer, Rasogulla

- Khoa and Basundi

-Ice-cream and Chese

Practical:

1) Physical Examination of milk
2) Platform tests of milk
3) Chemical examination of Milk – P^H, acidity
4) Adulteration test of milk
5) Preparation of Curd
6) Preparation of Shrikhand
7) Preparation of Gulabjamun
8) Preparation of Paneer
9) Preparation of Rasgulla
10) Visit to Dairy unit/Milk processing unit

Scheme of practical examination

External practical examination	**50 marks**
I) preparation of one of the product from above	20 marks
ii) Preparation of physical test/Determination of fat content	10 marks
iii) Submission of practical record book and visit report	10 marks
iv) Viva –voce	10 marks

Reference:

1) Day S., 1994, outlines of Dairy Technology, oxford Univ. press, New Delhi.
2) Rosenthal I,1991 , milk and milk products, VCH, New York.
3) Robinson R.K.., (2 vol. set),1986, Modern Dairy technology, Elsevier Applied science, UK.
4) Warnar J. M.., 1976, principal of Dairy processing, Wiley Estern Ltd, New Delhi

SHIVAJI UNIVERSITY , KOLHAPUR

Diploma in Food Processing and Preservation

Semester II – Paper –X

Food Quality Control and Waste Management

Work Load – 8	Total Marks – 100
Theory – 4 Lectures/Week	Theory – 50
Practical – 4 Lectures/Week/Batch	Practical – 50

Objectives:

To enable students –

1) To understand concept of sampling and quality of the foods.
2) To study the working of equipments for quality control of food products.

Course Content:

Unit – I **-Introduction to quality Control in food industry**

-General concepts of quality and quality Control

-Major quality Control functions

-Sampling of food

-Sample Selection and sampling plans

-Preparation and storage of Laboratory Samples

-Sampling Methods

Unit – II **-Standard tests for quality assessment**

-Physical Tests

-Chemical tests

-Microbiological tests

-Sensory analysis

Unit – III -Waste Management in Food Industry

-Types of waste generated: non-degradable & biodegradable wastes

-Methods of utilizing waste to make value added products

-Waste storage and disposal of liquid and gaseous waste-land- filling, burial

incineration, recycling biological treatment of food industry Waste

-Storage and disposal of liquid and gaseous waste

Unit – IV -Food laws and standards

-Exisiting food laws and standards in India

-Concept and application of ISO and HACCP.

Practical-

1) Determination of Moisture of food
2) Microbial sampling of an air
3) Determination of ash content of food
4) Determination of protein content of food
5) Determination of fat content from food sample
6) Determination of MPN count
7) Sensory analysis of food products
8) Determination of acidity
9) Determination of hardness of water.
10) Determination of BOD
11) Visit Quality Control Lab Unit and Waste disposal unit.

Scheme of practical examination

External; practical examination	**50 Marks**
i)Determination of one from above	20 marks
ii)sensory evaluation of any one food product	10 marks
iii)submission of practical record book and visit report	10 marks
iv)Viva – Voce	10 marks

References:

1. Philp, A .C Reconceptualizing quality, New Age international Publishers, Benglore.2001.
2. Bhatia, R. and Ichhpujan, R.L. Quality assurance in Microbiloogy.CBS publishers and Distributors, New Delhi.2004
3. Kher, C.P. Quality control for the food industry.ITC publishers,Geneva.2000.