

## UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY) Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

Academic Section Email: academicsectionju14@gmail.com

## NOTIFICATION (23/May/Adp./33)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the Syllabi and Courses of Study in the subject of Food Science and Quality Control of Semesters IIIrd and IVth for Four Year Under Graduate Programme under the Choice Based Credit System as per NEP-2020 (as given in the annexure) for the examinations to be held in the years as per the details given below:

Subject			Semester			for the	he exar e years	nination to be	held
Food Science	and Qu	iality C	Control Semester- Semester-	-111 -IV		Dece May	mber 2 2024, 2	023, 2024 and 2025 and 2026	2025
The Syllal www.jammu	oi of univers	the ity.ac.in	courses <u>n</u>	is	available	on	the	University	website:

## Sd/-DEAN ACADEMIC AFFAIRS

## No. F. Acd/II/23/ 3 222- 3232 Dated: 22-5- 2023

Copy for information and necessary action to:

- 1. Dean, Faculty of Science
- 2. Convener, Board of Studies in Home Science /Food Science and Quality Control.
- 3. Sr. P.A.to the Controller of Examinations
- 4. All members of the Board of Studies
- 5. Confidential Assistant to the Controller of Examinations
- 6. I/C Director, Computer Centre, University of Jammu
- 7. Deputy Registrar/Asst. Registrar (Conf. /Exams. UG/Eval Non-Prof)
- ,8. Incharge, University Website for Uploading of the notification.

Deputy Registrar (Academic)

8 (915 - Fraged 23

# University of Jammu

Syllabi of Food Science and Quality Control at Four Year Under Graduate Programme (FYUP) under Choice Based Credit System as per NEP – 2020

(Semester III & IV)

h

S.No	Cours	Course No.	Course	Credits (Theory		Mar	ks		Total
•	e Type		Title	+ Practical)	T	`heory	Practic	al/Tutor ils	Marks
1	Major	UMJFST301	Food Nutrition and Chemistry	(3+1)	Mid Semest er 15 Marks	End Exam 60 Marks	Assessm e nt 10 Marks	Exam 15 Marks	75 + 25 = <b>100</b>
2	Major	UMJFST302	Food Microbiol ogy	(3+1)	Mid Semest er 15 Marks	End Exam 60 Marks	Assessm e nt 10 Marks	Exam 15 Marks	75 + 25 = 100
3	Minor	UMIFST303	Introducti on to Food Nutrition and Chemistry	(3+1)	Mid Semest er 15 Marks	End Exam 60 Marks	Assessm e nt 10 Marks	Exam 15 Marks	75 + 25 = 100
4	Multi discipl inary	UMDFST304	Food Quality Assurance and Sensory Evaluation	3	Mid Semest er 15 Marks	End Exam 60 Marks			75
5	Skill Enhan cement Course	USEFST305	Bakery Technolog y and Entreprene urship	2	Mid Semest er 10 Marks	End Exam 40 Marks			50

## Semester - III (Examination to be held December 2023, 2024, 2025)

tre.

hos

### Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Theory)

#### Course Code: UMJFST301

Course Title: Food Nutrition and Chemistry Total No. of Lectures: 45

Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25

#### **Course Learning Objective:**

The Course is designed to enable the students to:

- Understand the relationship between nutrition and human well-being
- Know and understand the functions, importance of all nutrients for different age groups and special groups
- · Understanding of chemistry of major components of food
- Know Composition and properties of food nutrients.

#### UNIT-1

- > Definitions & concepts: Food, food chemistry, nutrition, nutrients, adequate nutrition, malnutrition.
- > Recommended dietary intake (RDI), Basal metabolism (BM), factors affecting RDI and BM.
- > Water in foods: structure- Hydrogen bonding, function, sources, requirement.

### UNIT - 2

- > Carbohydrates: Definition, classification, sources, properties. Nutritional and industrial importance.
- > Starch gelatinization and retrogradation.
- > Fats: Definition, sources, properties and rancidity. Significance of MUFAS and PUFAS.

#### UNIT-3

- > Proteins: Definition, classification, sources, properties and industrial importance.
- > Enzymes- Nomenclature, specificity, factors influencing enzyme activity
- > Enzyme added to food during processing

#### UNIT-4

- Pigments: Myoglobin, chlorophyll, anthocyanin and carotenoids: their sources and stability during processing.
- Non enzymatic browning reactions in foods- Caramelization and Maillard reaction.

## Food Science and Quality Control

#### Semester III

## (Examination to be held in December 2023, 2024, 2025)

Major Course (Theory)

Course Code: UMJFST301

## Course Title: Food Nutrition and Chemistry

#### **References:**

1. Sunitra Roday, Food Science and Nutrition, 3rd Edition, 2018

2. Sumati R Mudambi, Rajagopal M. V Fundamentals of Foods, Nutrition and Diet Therapy, 6th Edition, New Age International Publishers, 2010

3. Srilakshmi, B, Nutrition Science, New age international (P) Ltd publishers, New Delhi, 2016.

4. Swaminathan, M. Advanced Text book on food and Nutrition, Vol.I. Bangalore Printing and Publishing Co. Ltd Bangalore.

5. H.-D. Belitz, Wemer Grosch, Peter Schieberle, Food Chemistry, 3<sup>rd</sup> Edition, Springer-Verlag Berlin Heidelberg, 2004

6. John M. deMan, John W. Finley, W Jeffrey Hurst, Chang Yong Lee, Principles of Food Chemistry, 4<sup>th</sup> Edition, Springer, 2018

### Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Practical)

#### Course Code: UMJFST301

Course Title: Food Nutrition and Chemistry

Credits: 01 Maximum Marks: 25

#### Note: Perform at least any five of the following experiments

- Preparation of RDA for different Age Groups
- To Calculate BMI
- Preparation and standardization of Normal solutions.
- Preparation and standardization of Molar solutions
- Preparation of different strengths (percentage) of solutions
- Determination of moisture content on dry and wet weight basis.
- Determination of ash content.
- Qualitative and quantitative tests for proteins.
- Determination of crude fat.
- Proximate Composition of Food.
- Qualitative and quantitative tests of carbohydrates.
- Determination of crude fibre.
- Determination of free fatty acid and acid value.
- Determination of peroxide value.

## Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Practical)

### Course Code: UMJFST301

## Course Title: Food Nutrition and Chemistry

THEORY	and the descents of	trade and	
DESCRIPTION	TIME ALLOTTED	MARKS	
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15	
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks. PRACTICAL/TUTORIAL	2½ Hours	60	
Daily evaluation of practical's/tutorials/Viva voce/Records etc.	10 Marks for Co Assessment	ontinuous	
Final Examination Note: The BOS shall device the mechanism of Final examination.	15 Marks for Final examination		

### Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Theory)

Course Code: UMJFST302 Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25 Course Title: Food Microbiology Total No. of Lectures: 45

#### **Course Learning Objective:**

The Course is designed to enable the students to:

- Provide knowledge of different microorganisms associated with food and their role in spoilage and preservation of food.
- knowledge of microbes beneficial to humans
- · Impart knowledge various products produced by microbes.

#### UNIT - 1

- History and scope of microbiology.
- > Factors effecting microbial growth extrinsic and intrinsic factors.
- > Different Types of microorganisms.
- > Economic importance of microbes.

#### UNIT-2

- > Microbial spoilage of fresh foods-fruits, vegetables, cereals, pulses.
- Spoilage of meat and milk.
- Microbial spoilage of canned food.

#### UNIT - 3

- Industrial microbiology-scope and development
- > Industrial production of enzyme (any one enzyme)
- > Industrial production of single cell protein

#### UNIT - 4

- > Fermented food and their benefits: sauerkraut, Olives, Gherkins, yoghurt, cheese
- > Probiotics and their health benefits

#### References:

1. FOSTER W.M, Food Microbiology, (2020), CBS Publisher

2. Jav, J.M., Lossner, M.J and Golden, D.A. (2008). Modern Food Microbiology. 7th edition. Springer.

3. Adams, M.R and Moss, M.O. (2018). Food Microbiology. New Age International Pvt. LTd. Publishers.

4. Ray, B., Bunia, A., (2007), Fundamental Food Microbiology 4th Edition, Taylor & Francis Ltd

5. William C. Frazier, Dennis C. Westhoff, N.M. Vanitha., Food Microbiology, 5th Edition (2017), McGraw Hill Education Publisher

## Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Practical)

Course Code: UMJFST302 Credits: 01 Maximum Marks: 25

Course Title: Food Microbiology

## Note: Perform at least any five of the following experiments

- 1. Microscope: Types and working of microscope
- 2. To study the working of Autoclave.
- 3. Cleaning and sterilization of glassware
- 4. Demonstration of sterilization of equipment
- 5. Preparation of nutrient agar medium
- 6. Enumeration of microbes from food samples- TPC
- 7. Inoculation techniques
- 8. Gram staining
- 9. Identification of bacteria on the basis of:
  - Cultural characteristics
  - Morphological characteristics
- 10. Demonstration and identification of permanent slides.
- 11. Preparation of Yogurt
- 12. Preparation of any fermented product (Lactic Acid Fermentation)
- 13. Pasteurization of milk.

## Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Major Course (Theory)

Course Code: UMJFST302

**Course Title: Food Microbiology** 

## Scheme of Examination:

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	2½ Hours	60
PRACTICAL/TUTORIAL Daily evaluation of practical's/tutorials/Viva voce/Records etc.	10 Marks for Co Assessment	ontinuous
Note: The BOS shall device the mechanism of Final examination.	Examination	1141

## Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Minor Course (Theory)

#### Course Code: UMIFST303

Course Title: Introduction to Food Nutrition and Chemistry Total No. of Lectures: 45

Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25

#### Course Learning Objective:

The Course is designed to enable the students to:

- Understand the relationship between nutrition and human well-being
- Know and understand the functions, importance of all nutrients for different age groups and special groups
- · Understanding of chemistry of major components of food
- Know Composition and properties of food nutrients.

#### UNIT-1

- > Definitions & concepts: Food, food chemistry, nutrition, nutrients, malnutrition.
- > Recommended dietary intáke (RDI), Basal metabolism (BM)
- > Water in foods: function, sources, requirement.

### UNIT - 2

- Carbohydrates: Definition, classification, sources, properties. Nutritional importance. Starch gelatinization and retrogradation.
- > Fats: Definition, classification, sources, properties and rancidity.
- Significance of MUFAS and PUFAS.

#### UNIT-3

- Proteins: Definition, classification, sources, properties and importance.
- > Enzymes- Nomenclature, specificity, factors influencing enzyme activity
- Enzymes added to food during processing

## UNIT-4

- > Pigments: Myoglobin, chlorophyll, anthocyanin and carotenoids: their sources and stability
- during processing.
- Non enzymatic browning reactions in foods- Caramelization and Maillard reaction.

### Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Minor Course (Theory)

Course Code: UMIFST303

Course Title: Introduction to Food Nutrition and Chemistry

References:

1. Sunitra Roday, Food Science and Nutrition, 3rd Edition, 2018

2. Sumati R Mudambi, Rajagopal M. V Fundamentals of Foods, Nutrition and Diet Therapy, 6th Edition, New Age International Publishers, 2010

3. Srilakshmi, B, Nutrition Science, New age international (P) Ltd publishers, New Delhi, 2016.

4. Swaminathan, M. Advanced Text book on food and Nutrition, Vol.I. Bangalore Printing and Publishing Co. Ltd Bangalore.

5. H.-D. Belitz, Werner Grosch, Peter Schieberle, Food Chemistry, 3<sup>rd</sup> Edition, Springer-Verlag Berlin Heidelberg, 2004

6. John M. deMan, John W. Finley, W Jeffrey Hurst, Chang Yong Lee, Principles of Food Chemistry, 4<sup>th</sup> Edition, Springer, 2018

## Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 Food Science and Quality Control Semester III (Examination to be held in December 2023, 2024, 2025) Minor Course (Practical)

## Course Code: UMIFST303

Course Title: Introduction to Food Nutrition and Chemistry

Credits: 01 Maximum Marks: 25

## Note: Perform atleast any five of the following experiments:

- Preparation of RDA for different Age Groups
- To Calculate BMI
- Preparation and standardization of Normal solutions.
- Preparation and standardization of Molar solutions
- Preparation of different strengths (percentage) of solutions
- Determination of moisture content on dry and wet weight basis.
- Qualitative and quantitative tests for proteins.
- Determination of crude fat.
- Qualitative and quantitative tests of carbohydrates.
- Determination of crude fibre.
- Determination of free fatty acid and acid value.
- Determination of peroxide value.

Course Code: UMIFST303

Course Title: Introduction to Food Nutrition and Chemistry

#### Scheme of Examination:

THEORY				
DESCRIPTION	TIME ALLOTTED	MARKS		
Mid Semester Assessment Test shall be conducted by	1½ Hours	15		
the course coordinator after completion of the syllabus				
up to 50% and the pattern of the examination shall be				
decided by the respective Board of Studies				
End Semester University Examination shall be conducted for entire	2 <sup>1</sup> / <sub>2</sub> Hours	60		
syllabus. The break up is as under:				
Section A shall consist Four (4) short answer questions having one				
question from each unit. The students are required to attempt all				
questions. Each question shall be of 3 Marks.				
Section B shall consist Eight (8) long answer questions having two		1911		
questions from each unit. The students are required to attempt one		Sector States		
question from each unit. Each question shall be of 12 Marks.				
PRACTICAL/TUTORIAL				
Daily evaluation of practical's/tutorials/Viva	10 Marks for Co	ntinuous		
voce/Records etc.	assessment			
Final Examination	15 Marks for Fir	nal		
Note: The BOS shall device the mechanism of Final	examination			
examination.				

## Food Science and Quality Control

#### Semester III

## (Examination to be held in December 2023, 2024, 2025)

#### Multi- disciplinary Course

#### Course Code: UMDFST304

Credits: 03

Course Title: Food Quality Assurance and Sensory Evaluation Total No. of Lectures: 45

## Course Learning Objective:

The Course is designed to enable the students to

- Understand about food quality and its evaluation.
- Know about different methods being used to assure quality.
- Understand about Sensory Evaluation Techniques to assure quality of food products.

## Unit-I

- > Definition and importance of Quality control and Quality Assurance
- > Quality attributes of Food Nutritional quality, Microbial, Sensory.
- Sampling-Definition and types

### Unit –2

- > Food Safety and Standards Act-2006.
- Codex Alimentarus Commission
- Basic Concept of Hazard Analysis Critical Control Point (HACCP) and Good Manufacturing Practices (GMP)

## Unit – 3

- > Definition of Sensory Evaluation, Subjective and Objective evaluation
- Human Senses: Sight, Smell, Taste, Sound and Touch
- > Basic Taste: Sweet, Salty, Sour, Bitter and Umami.
- Selection of sensory panel

## Unit – 4

- Threshold tests for basic tastes
- Different types of sensory tests:
  - o Paired Comparison Test.
  - Rank Test
  - o Score Test
  - o Hedonic Scale

#### Food Science and Quality Control

### Semester III

## (Examination to be held in December 2023, 2024, 2025)

## Multi- disciplinary Course

#### Course Code: UMDFST304

Course Title: Food Quality Assurance and Sensory Evaluation

#### References:

1. Eram S. Rao., Food Quality Evaluation, Variety Books Publishers and Distributors (2013)

2. Pomeranz, Y. Food Analysis-Theory and Practice, Springer

3. Nielsen, Suzanne, Food Analysis, Springer US (2010)

4. Sensory Evaluation of Food by Hildegarde Heymann, Harry T. Lawless

5. Sensory Evaluation Techniques by Gail Vance Civille, B. Thomas Carr

6. Food Science by B. Srilakshmi

THEORY				
DESCRIPTION	TIME ALLOTTED	MARKS		
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15		
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	2 <sup>1</sup> / <sub>2</sub> Hours	60		

#### Food Science and Quality Control

#### Semester III

#### (Examination to be held in May 2024, 2025, 2026)

#### **Skill Enhancement Course**

Course Code: USEFST305 Credits: 02 Maximum Marks: 50 Course Title: Bakery Technology and Entrepreneurship Total No. of Lectures: 30

#### **Course Learning Objective:**

The Course is designed to enable the students to

- Understanding of composition of cereals being used in bakery.
- Know changes occurring in various baked products as a result of processing.
- Use the theoretical knowledge in various applications and bakery products preparations.

#### Unit-I

- > History of Bakery, Present Trends Prospects Nutrition facts of Bakery.
- Wheat: Structure and Composition of wheat, Wheat products Whole wheat flour, Maida, semolina, Role of Gluten
- > Raw materials used and their role in Bakery Flour, Yeast, Sugar, Fats, Salt, Additives

#### Unit-II

- > Bread, Biscuits, Cakes & Pastries Methods of preparation
- > Modification of bakery products for people with special nutritional requirements, e.g. high fibre, low sugar, low fat, gluten free bakery products.

#### Unit-III

- > Setting up of a Bakery Unit:
- Bakery equipment required
- · Bakery norms and Standards,
- Illumination and ventilation
- Cleaning & sanitization

#### REFERENCES

1. Kurt A. Rosentrater, A.D.Evers., Kent's Technology of Cereals, 5th Edition, Woodhead Publishing (2018)

- 2. P.J.Fellows., Food Processing Technology, (2016) 4th Edition, Woodhead Publishing
- 3. Cereals and Cereal Processing: Chemistry and Technology DAV Dendy & BJ
- 4. Chemistry and Technology of Cereal Food and Feed S A Matz
- 5. Bakery Technology and Engineering S A Matz

6. Bakery Flour Confec Syllabi of Food Science and Quality Control at FYUP under CBCS as per NEP-2020 tionary L J Hanneman

## Food Science and Quality Control

## Semester III

## (Examination to be held in May 2024, 2025, 2026)

## **Skill Enhancement Course**

**Course Code: USEFST305** 

Course Title: Bakery Technology and Entrepreneurship

THEORY				
DESCRIPTION	TIME ALLOTTED	MARKS		
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	10		
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions covering each unit. The students are required to attempt all questions. Each question shall be of 2½ Marks. Section B shall consist Six (6) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 10 Marks.	2½ Hours	40		

S. No	Course	Course No.	Course	Credits (Theory	Marks	ta da califica	n an	r .	Total Mark
•	Type		The	Practical)	Theory		Practical/Tutorials		S
1	Major	UMJFST401	Processing of Fruits and vegetable	(3+1)	Mid Semester 15 Marks	End Exam 60 Marks	Assessment 10 Marks	Exam 15 Marks	75 + 25 = <b>100</b>
2	Major	UMJFST402	Processing of Milk and Milk Products	(3+1)	Mid Semester 15 Marks	End Exam 60 Marks	Assessment 10 Marks	Exam 15 Marks	75 + 25 = <b>100</b>
3	Major	UMJFST403	Processing of Cereals, Pulses & Oil Seeds	(3+1)	Mid Semester 15 Marks	End Exam 60 Marks	Assessment 10 Marks	Exam 15 Marks	75 + 25 = 100
4	Major	UMJFST404	Processing of Egg, Meat and Fish	(3+1)	Mid Semester 15 Marks	End Exam 60 Marks	Assessment 10 Marks	Exam 15 Marks	75 + 25 = 100
5	Minor	UMIFST405	Processing of Fruits and vegetable	(3+1)	Mid Semester 15 Marks	End Exam 60 Marks	Assessment 10 Marks	Exam 15 Marks	75 + 25 = <b>100</b>

## Semester - IV (Examination to be held May 2024, 2025, 2026)

18

Course Code: UMJFST401 Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25

**Course Title:** Processing of Fruits and vegetables **Total No. of Lectures:** 45

#### **Course Learning Objectives:**

The Course is designed to enable the students to:

- · Understand about production, composition and processing of various staple food crops
- · Acquaint the students about production, post-harvest physiology of different fruits and vegetables
- Understand about processing of Fruits and Vegetables.

#### Unit - 1

- Production trends of different Fruits and Vegetables in India and World
- Chemical composition and nutritional significance of Fruits and Vegetables
- Maturity and ripening.
- Post-harvest loses in fruits and vegetables.
- > Post-harvest physiology and handling of fruits and vegetables, respiration, transpiration, etc.

Unit – 2

- > Packaging requirements of fruits & vegetables.
- > Storage of fruits and vegetables. Refrigerated and controlled atmospheric storage
- > Processed products of fruits (jam, jelly, marmalade).

Unit –3

- > Beverages: Juice, nectar, squash, cordial, concentrate
- Tomato products-puree, ketchup and sauce
- Vegetable pickles

Unit – 4

- Drying and Dehydration of Fruits and Vegetables
- Freezing technology of vegetables (IQF)
- Canning of fruits and vegetables.

#### **References:**

- 1. R.P. Srivastva, S. Kumar., Fruit & Vegetable Preservation, 3rd Edition (2019), CBS Publishers
- 2. Kurt A. Rosentrater, A.D. Evers., Kent's Technology of Cereals, 5th (Ed) Woodhead Publishing (2018)
- 3. P.J.Fellows., Food Processing Technology, (2016) 4th Edition, Woodhead Publishing
- 4. Norman N Potter, H.H. Joseph., Food Science, 5th Edition (2007)

5. Girdhari Lal, Siddhapa & Tandon, Preservation of Fruits and Vegetables, Bombay Popular Prakashan. 6. S.C. Dubey, Basic Baking.

Course Code: UMJFST401 Credits: 01 Maximum Marks: 25 Course Title: Processing of Fruits and Vegetables

Note: Perform any five of the following experiments as per the availability of equipment/ apparatus List of Experiments:

- 1. Preparation of preserves.
- 2. Preparation of Fruit Candies
- 3. Preparation of squash/Lime Cordial
- 4. Preparation of tomato sauce/ketchup
- 5. Preparation of syrup & brine solutions
- 6. Preparation of Vegetable Pickles
- 7. Cut out analysis of canned fruits & vegetables.
- 8. Dehydration of Vegetables (Check rehydration ratio also)

THEORY					
DESCRIPTION	TIME ALLOTTED	MARKS			
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15			
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all	2 <sup>1</sup> / <sub>2</sub> Hours	60			
questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.		ing attack			
Daily evaluation of practical's/tutorials/Viva voce/Records etc.	10 Marks for C Assessment	ontinuous			
Final Examination15 Marks for FinalNote: The BOS shall device the mechanism of FinalExaminationexamination.Examination					

Course Code: UMJFST402 Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25 **Course Title:** Processing of Milk and Milk Products **Total No. of Lectures:** 45

#### **Course Learning Objectives:**

The Course is designed to enable the students to:

- · Provide an understanding of composition of various Milk and milk products
- · Familiarize students with changes occurring in various milk and milk products during processing
- Enable students to use the theoretical knowledge in various applications and food preparations **Unit-I** 
  - Dairy Industry in India and its scope
  - > Various factors affecting the composition of milk from various species.
  - > Physico-chemical properties and nutritive value of milk
  - Microbiology of milk, source of contamination
  - Methods of milk collection, transportation and storage of liquid milk

#### Unit-II

- > Liquid milk processing Filtration/Clarification, Standardization, Pasteurization (LTLT, HTST)
- > Packaging, Distribution and storage of liquid Milk
- > Special types of milk- sterilized, flavoured, homogenized, reconstituted, toned, double toned and standardized

## Unit-III

- > Technology of cream, butter, and ghee manufacture
- Technology of evaporated milk, condensed milk, Non-fat milk solid (Skim milk powder) Full fat milk powder.
- > Fortification of milk products with nutrients

### Unit-IV

- Packaging of dairy products
- Quality standards Milk plant sanitation and hygiene
- > By product of dairy industry and their utilization

#### **References:**

- 1. Outlines of Dairy Technology by Sukumar De
- 2. Food Science by B. Srilakshmi
- 3. Warner J. M, 1976 Principles of Dairy Processing

#### Major Course (Practical)

Course Code: UMJFST402 Credits: 01 Maximum Marks: 25

Course Title: Processing of Milk and Milk Products

Note: Perform any five of the following experiments as per the availability of equipment/ apparatus List of Experiments:

- Receiving and platform test of milk
- Estimation of fat and SNF in milk
- Preparation of special milk
- Quantitative determination of milk constituents
- Determination of pH of milk
- Determination of viscosity of milk
- Determination of specific gravity of milk
- · Detection and estimation of adulterants and preservatives in milk
- Preparation of indigenous milk products
- Pasteurization of milk
- · Visit to milk processing plant

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by	1½ Hours	15
the course coordinator after completion of the syllabus		
up to 50% and the pattern of the examination shall be	1. S.	
decided by the respective Board of Studies		No. Astrony
End Semester University Examination shall be conducted for entire	2 <sup>1</sup> / <sub>2</sub> Hours	60
syllabus. The break up is as under:		
Section A shall consist Four (4) short answer questions having one		
question from each unit. The students are required to attempt all	118 / A-2	
questions. Each question shall be of 3 Marks.		
Section B shall consist Eight (8) long answer questions having two		
questions from each unit. The students are required to attempt one	-	
question from each unit. Each question shall be of 12 Marks.		
PRACTICAL/TUTORIAL		
Daily evaluation of practical's/tutorials/Viva	10 Marks for Co	ontinuous
voce/Records etc.	Assessment	1. A. A.
Final Examination	15 Marks for Fin	nal
Note: The BOS shall device the mechanism of Final	Examination	
examination.	and the second second	

Course Code: UMJFST403 Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25

Course Title: Processing of Cereals, Pulses & Oil Seeds Total No. of Lectures: 45

#### **Course Learning Objectives:**

The Course is designed to enable the students to:

- Provide an understanding of composition of Cereals, Pulses & Oil Seeds.
- Familiarize students with changes occurring in various Cereals, Pulses & Oil Seeds as a result of processing and cooking.
- Enable students to use the theoretical knowledge in various applications and food preparation

#### **UNIT-I**

- Wheat production, varieties and their quality.
- Structure and composition.
- > Milling of wheat, Different types of wheat products

#### UNIT-II

- > Rice structure and composition
- > Aging of Rice, Methods of accelerating aging of rice.
- > Rice milling, Milling effects on nutrition and quality of rice. Methods of parboiling, economics and nutritional
- > Maize Technology: Maize structure and
- Maize Milling (Dry & Wet)

#### UNIT-III

- Pulses & Legumes: Structure, Composition
- Processing of Pulses and legumes
- Fermentation and germination
- Toxic and anti-nutritional Constituents in Pulses and Legumes.

#### UNIT-IV

- Oil seeds: Composition
- Oilseed Extraction: Pressing, Solvent extraction, purification (Degumming, refining, bleaching, deodorization), hydrogenation, plasticizing
- > Tempering products- margarine, shortening, mayonnaise and salad dressings
- By-products of Oil Seeds.

#### Food Science and Quality Control

#### Semester IV

#### (Examination to be held in May 2024, 2025, 2026)

#### **References:**

1. Wheat Chemistry and Technology by Yashajaha Pomeranz F, H Websten

2. Oats Chemistry and Technology by F.H. Wensten

3. Cam Chemistry and Technology by S.A. Watsan and P.E.

4. Rice Chemistry and Technology by B.O. Juliano

5. Durum Wheat Chemistry and Technology by G. Fabriani and C. Lintas

6. The Amylography Handbook by W.C. Shuey and K.H. Topples

7. Fundamentals of Dough Rheology by H, Faridi and J.M. Faubion

8. The Farinograph Hanbook by B.L.D. Appolonia and W.H. Kunerih

9. Food Science, Fifth Edition, Potter, N. and Hotchkiss, J.H.

10. Mathews, R.H. Legumes: Chemistry, Technology and Human Nutrition

11. Maize: Recent Process in Chemistry and Technology by George E. Inglett

## Course Code: UMJFST403

Course Title: Processing of Cereals, Pulses & Oil Seeds

### Credits: 01 Maximum Marks: 25

# Note: Perform any five of the following experiments as per the availability of equipment/ apparatus List of Experiments:

- Preparation of grain samples for Evaluation.
- Physical Evaluation of Food Grains.
- Determination of Moisture content of any cereal/cereal product
- Determination of Gluten Content in wheat flour.
- Evaluation of cooking quality of rice
- Evaluation of cooking quality of Pulses
- Puffing and popping of grains
- Experimental baking of Bread/Biscuit
- Preparation of premixes
- Visit to Cereals/Pulses processing plant

THEORY	and the second second	
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by	1 <sup>1</sup> / <sub>2</sub> Hours	15
the course coordinator after completion of the syllabus		
up to 50% and the pattern of the examination shall be		
decided by the respective Board of Studies		
End Semester University Examination shall be conducted for entire	2 <sup>1</sup> / <sub>2</sub> Hours	60
syllabus. The break up is as under:	2/2110015	00
Section A shall consist Four (4) short answer questions having one	·	
question from each unit. The students are required to attempt all		
questions. Each question shall be of 3 Marks.		
Section B shall consist Eight (8) long answer questions having two		
questions from each unit. The students are required to attempt one		
question from each unit. Each question shall be of 12 Marks.		
PRACTICAL/TUTORIAL		
Daily evaluation of practical's/tutorials/Viva	10 Marks for Co	ntinuous
voce/Records etc.	Assessment	nunuous
Final Examination	15 Marks for Eir	1
Note: The BOS shall device the mechanism of Final	Eveningtion	121
examination.	Examination	

#### Major Course

#### **Course Code: UMJFST404**

Course Title: Processing of Egg, Meat and Fish

Credits: 03

Total No. of Lectures: 45

Maximum Marks: 100

Theory= 75

Practical/Tutorial= 25

#### **Course Learning Objectives:**

The course is designed to enable the students to:

- Provide an understanding Egg, Meat and Fish.
- Familiarize students with changes occurring in egg, Meat & Fish as a result of processing and cooking.
- Enable students to use the theoretical knowledge in various applications and food preparations.

#### Unit-I

- > Scope of meat and meat products Industry in India.
- > Model Abattoirs, typical layout and features; Anti-mortem handling
- > Chemical composition and nutritive value of meat.
- > Postmortem biochemical changes- factors affecting post mortem changes
- > Properties of fresh meat
- > Packaging of meat-fresh and cured.
- > Preservation of Meat chilling, freezing, curing, smoking, canning, dehydration, irradiation,

#### Unit-II

- > Egg processing: structure, composition nutritive value functional properties of eggs.
- > Quality of eggs and its preservation
- > Microbial spoilage of eggs.
- > Egg products- Egg Powder, frozen eggs, egg foams.
- Packaging and transportation of eggs

#### Unit-III

- > Poultry-types, factors affecting quality
- > Chemical composition and nutritive value of poultry meat
- Poultry dressing-pre and post mortem examination, methods of stunning, slaughter, scalding and dressing. Grading and packaging of poultry meat

>

## Course Code: UMJFST404

## Course Title: Processing of Egg, Meat and Fish

Preservation of poultry meat-chilling, freezing, curing, smoking, dehydration, canning, irradiation Utilization of poultry industry by-products

Unit-IV

- Fisheries resources of the world
- > Cold storage and freezing preservation of fish.
- Canning of fish and fish products.
- > Drying and dehydration. Smoking, curing and pickling.
- Fish oils, fish protein concentrates, fish meal
- > By products of fish processing industry.

#### **References:**

1. Technology of Dairy products by Early, R

- 2. Outlines of Dairy Technology by De Sukumar
- 3. Egg Science & Technology by Staddeman
- 4. Principles of Meat Science by Ferral et al 5. Poultry Products Technology by G.J. Mountney

h

Course Code: UMJFST404 Credits: 01 Maximum Marks: 25 Course Title: Processing of Egg, Meat and Fish

Note: Perform any five of the following experiments as per the availability of equipment/ apparatus List of Experiments:

- Meat cutting and handling
- Evaluation of meat quality
- Pickling of fish and meat
- Candling Test on Fish
- Experiment on egg- structure, composition, quality determination
- Calculate Albumin Index and Yolk Index.
- · Preservation and preparation of different egg products

## Scheme of Examination:

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks.	2½ Hours	60
Daily evaluation of practical's/tutorials/Viva voce/Records etc. Final Examination Note: The BOS shall device the mechanism of Final examination.	10 Marks for Co assessment 15 Marks for Fir examination	ntinuous 1al

Course Code: UMJFST401 Credits: 03 Maximum Marks: 100 Theory= 75 Practical/Tutorial= 25 **Course Title:** Processing of Fruits and vegetables **Total No. of Lectures:** 45

#### Course learning objectives:

The Course is designed to enable the students to:

- Understand about production, composition and processing of various staple food crops
- Acquaint the students about production, post-harvest physiology of different fruits and vegetables
- Understand about Processing of Fruits and Vegetables

#### Unit – 1

- > Production trends of different Fruits and Vegetables in India and World
  - Chemical composition and nutritional significance of Fruits and Vegetables
- > Maturity and ripening.
- > Post-harvest loses in fruits and vegetables.
- > Post-harvest physiology and handling of fruits and vegetables, respiration, transpiration, etc.

#### Unit - 2

- > Packaging requirements of fruits & vegetables.
- > Storage of fruits and vegetables. Refrigerated and controlled atmospheric storage
- > Processed products of fruits (jam, jelly, marmalade).

#### Unit -3

- > Beverages: Juice, nectar, squash, cordial, concentrate
- > Tomato products-puree, ketchup and sauce
- Vegetable pickles

#### Unit – 4

- Drying and Dehydration of Fruits and Vegetables
- Freezing technology of vegetables (IQF)
- Canning of fruits and vegetables.

Course Code: UMJFST405

Course Title: Processing Fruits and Vegetables

#### **References:**

- 1. R.P. Srivastva, S. Kumar., Fruit & Vegetable Preservation, 3<sup>rd</sup> Edition (2019), CBS Publishers
- Kurt A. Rosentrater, A.D.Evers., Kent's Technology of Cereals, 5<sup>th</sup> Edition, Woodhead Publishing (2018).
- 3. P.J.Fellows., Food Processing Technology, (2016) 4th Edition, Woodhead Publishing
- 4. Norman N Potter, H.H. Joseph., Food Science, 5th Edition (2007)
- 5. Girdhari Lal, Siddhapa & Tandon, Preservation of Fruits and Vegetables, Bombay Popular Prakashan.
- 6. S.C. Dubey, Basic Baking,

Course Code: UMJFST405 Credits: 01 Maximum Marks: 25

Course Title: Processing Fruits and Vegetables

## Note: Perform atleast five of the following experiments

- Preparation of syrup & brine solutions
- Preparation of preserves.
- Preparation of Fruit Candies
- Preparation of squash/Lime Cordial
- Preparation of tomato sauce/ketchup
- Preparation of Vegetable Pickles
- Cut out analysis of canned fruits/vegetables.
- Dehydration of Vegetables (Check rehydration ratio also).

THEORY		
DESCRIPTION	TIME ALLOTTED	MARKS
Mid Semester Assessment Test shall be conducted by the course coordinator after completion of the syllabus up to 50% and the pattern of the examination shall be decided by the respective Board of Studies	1½ Hours	15
End Semester University Examination shall be conducted for entire syllabus. The break up is as under: Section A shall consist Four (4) short answer questions having one question from each unit. The students are required to attempt all questions. Each question shall be of 3 Marks. Section B shall consist Eight (8) long answer questions having two questions from each unit. The students are required to attempt one question from each unit. Each question shall be of 12 Marks. PRACTICAL/TUTORIAL	2½ Hours	60
Daily evaluation of practical's/tutorials/Viva voce/Records etc. Final Examination Note: The BOS shall device the mechanism of Final examination.	10 Marks for Continuous assessment 15 Marks for Final examination	