

E.M.G. YADAVA WOMEN'S COLLEGE , MADURAI – 625 014.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (**3rd Cycle**) with Grade **A+ & CGPA 3.51** by NAAC

DEPARTMENT OF NUTRITION & DIETETICS



CBCS With OBE

BACHELOR OF SCIENCE

PROGRAMME CODE - N

COURSE STRUCTURE

(w.e.f. 2022 – 2023 Batch onwards)



E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.

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CRITERION - I

1.1.3 Details of courses offered by the institution that focus on employability / entrepreneurship / skill development during the year.

Syllabus copies with highlights of contents focusing on
Employability / Entrepreneurship / Skill Development



To be Noted:

HIGHLIGHTED COLORS	COURSES
	Employability
	Skill Development
	Entrepreneurship
	Skilled & Employability

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

(Re –accredited (3rd cycle) with Grade A⁺ and CGPA 3.51 by NAAC)**DEPARTMENT OF NUTRITION AND DIETETICS – UG**
(with Allied Chemistry)**CBCS with OBE**
COURSE STRUCTURE
(w.e.f. 2022 – 2023 Batch onwards)

Semester	Part	Course Code	Title of the Course	Teaching hrs (per week)	Duration of Exam (hrs.)	Marks Allotted			Credits
						CIA	SE	Total	
III	I	22OU1TA3	Part I : Tamil	6	3	25	75	100	3
	II	22OU2EN3	Part II : English	6	3	25	75	100	3
	III	22OUND31	Core : Fundamentals of Nutrition	4	3	25	75	100	4
	III		Core : Lab – in – Nutritional Biochemistry	2	-	-	-	-	-
	III	22OUNDGEND3	GEC : Bakery	6	3	25	75	100	4
	III	22OUNDGECH3	GEC : Chemistry – I Bio Chemistry	4	3	25	75	100	4
	III		GEC : Chemistry Practical – I Inorganic Qualitative Analysis	2	-	-	-	-	-
IV	I	22OU1TA4	Part I : Tamil	6	3	25	75	100	3
	II	22OU2EN4	Part II : English	6	3	25	75	100	3
	III	22OUND41	Core : Nutritional Biochemistry	4	3	25	75	100	4
	III	22OUND4P	Core : Lab – in – Nutritional Biochemistry	2	3	40	60	100	2
	III	22OUNDGEND4	GEC : Food Preservation	4	3	25	75	100	4
	III	22OUNDGEND4P	GEC I : Practical - I Bakery and Food Preservation	2	3	40	60	100	1
	III	22OUNDGECH4	GEC : Chemistry – II Environmental and Organic Chemistry	4	3	25	75	100	4
	III	22OUNDGECH4P	GEC : Chemistry Practical - I Inorganic Qualitative Analysis	2	3	40	60	100	1

GEC : Generic Elective Course

SEC : Skill Enhancement Course

DSEC : Discipline Specific Elective Course

AECC: Ability Enhancement Compulsory Course

IDC : Inter Disciplinary Course

DSEC: Discipline Specific Elective Course:

Semester - V (DSEC– I & II – Choose any one)

1. Food Service Management – 22OUNDDSE5A
2. Functional Foods and Nutraceuticals – 22OUNDDSE5B

Semester – VI DSEC – II (Choose any one)

1. Food Safety and Quality control –22OUNDDSE6A
2. Post Harvest Technology –22OUNDDSE6B

Semester – VI DSEC– III

Dietetic Internship Project – 22OUNDDSEPR6

NOTE: The students are permitted to obtain additional credits (Optional)

1. MOOCs / SWAYAM / NPTEL Courses (Online)

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core	22OUND31	Core : Fundamentals of Nutrition	4	4	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives

Objectives:

1. Acquire knowledge on the structure of basic terminology and several aspects of nutrition and the functions of food in healthy life sustenance.
2. Familiarize with the nutrient classification, nutrition during deficiency conditions.
3. Understanding of modern aspects of nutritional science.

Unit -I

Nutrition and Health: Definition, relation of food to health, RDA, factors affecting RDA, reference man and woman.

Energy: Units of energy, determination of energy content of foods – bomb calorimeter, determination of energy requirements, basal metabolic rate, factors affecting BMR, SDA of foods, deficiency conditions of energy.

Unit – II

Carbohydrates: classification, sources, functions, digestion, absorption, deficiency conditions of carbohydrates.

Dietary fibre: classification, sources, role of dietary fibre, deficiency conditions of dietary fibre.

Water: functions, types, distribution, dehydration

Unit - III

Protein: Nutritional Classification, functions, digestion, absorption, protein quality (BV, PER, NPU), types of amino acids, deficiency conditions of protein.

Unit - IV

Lipids: Classification, functions, digestion, absorption, deficiency conditions of lipids.

Fatty acids: Classification-saturated, unsaturated, monounsaturated and polyunsaturated, sources, deficiency conditions of lipids.

Unit - V

Vitamins: Fat soluble –A,D,E and K ,water soluble –B₁,B₂, B₃,B₆,B₁₂, foliacid,Biotin and vitamin C functions, sources, deficiency.

Minerals: Classification, functions, sources and deficiencies - calcium, phosphorus, iron, iodine, zinc, sodium, Potassium and magnesium.

Books for Study:

- 1.Gajalakshmi.R ,*Nutrition Science* (1st edn) CBS Publisher &Distributers Pvt Ltd New Delhi,2014
2. Srilakshmi. B, *Nutriton Science* (5th edn.), New Age International Publications, New Delhi, 2017.
3. Sunetra Roday, *Food Science & Nutrition*, (2nd edn.), Macmillan publishing co., New Delhi, 2012.

Books for Reference:

- 1.Raneena Begum.M, *Foods,Nutrition &Dietetics*(3rd edn),Sterling Publishing Privat Limited, New Delhi ,2013.
2. Shrinandan Bansal, *Food and Nutrition* (3rd edn), AITBS Publisher,India ,2012.
3. Shubhangini A Joshi, *Nutrition and Dietetics with Indian Case Studies* (4th edition.), Tata McGraw Hill Education Pvt Ltd 2011.
4. Srilakshmi. B, *Human Nutriton(For B.Sc Nursing Student)* (2nd edn.), New Age International Publications, New Delhi, 2011.
5. Swaminathan, M. *Advanced Text Book on Food and Nutrition*, Vol. I & Vol. II (22nd edn.), Published by The Bangalore Printing and Publishing Co.Ltd, 2010.

Web Resources / E.Books:

- 1.[https://www.vidyawarta.com > uploads > 2019/09](https://www.vidyawarta.com/uploads/2019/09)
2. [https://open.umn.edu > opentextbooks > textbooks](https://open.umn.edu/opentextbooks/textbooks)
- 3.[https://books.google.com > Medical > Nutrition](https://books.google.com/Medical/Nutrition)
- 4,[https://books.google.com > ... > Nursing > Nutrition](https://books.google.com/.../Nursing/Nutrition)
- 5.[https://cuils.cuchd.in > cgi-bin > koha > opac-search](https://cuils.cuchd.in/cgi-bin/koha/opac-search)

Pedagogy:

Chalk and Talk, PPT, group discussion, OHP presentations, quiz, on the spot test and Virtual Labs.

Rationale for nature of Course:**Knowledge and Skill:**

To gain knowledge regarding the nutrients and health.

To know about the nutritional functions, digestion and deficiency conditions.

Activities to be given:

Innovation recipes. Assignment, ppt, Quiz, Group discussion.

Course learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge (According to Bloom's Taxonomy)
CLO1	Define the units and concept of energy.	K1 to K3
CLO2	Classify carbohydrate and dietary fibre.	K1 to K3
CLO3	Describe functions, deficiency and excess of various nutrients.	K1 to K4
CLO4	Classify the different micronutrients and interpret its functions, metabolism and deficiency.	K1 to K3
CLO5	Analyze the importance of vitamins and minerals in maintaining optimum health.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	1	2	3	1	2	3
CLO2	2	2	2	3	2	3
CLO3	1	3	3	3	2	3
CLO4	3	2	2	3	2	2
CLO5	2	3	3	3	2	2

1-Basic Level

2- Intermediate Level

3- Advanced Level

LESSON PLAN : TOTAL HOURS(60 HRS)

Unit	Description	Hrs	Mode
1	Unit – I Nutrition and Health: Definition, relation of food to health, RDA, factors affecting RDA, reference man and woman. Energy: Units of energy, determination of energy content of foods – bomb calorimeter, determination of energy requirements, basal metabolic rate, factors affecting BMR, SDA of foods.	12	Chalk and talk, Group Discussions, Quiz
2	Unit – II. Carbohydrates: classification, sources, functions, digestion, absorption. Dietary fibre :classification, sources, role of dietary fibre. Water: functions, types, distribution, dehydration	9	Chalk and talk, Quiz
3	Unit – III Protein: Nutritional Classification, functions, digestion, absorption, protein quality (BV, PER, NPU), types of amino acids	15	Chalk and talk, PPT, On the spot Test
4	Unit –IV Lipids: Classification, functions, digestion, absorption. Fattyacids: Classification-saturated,unsaturated, monounsaturated and polyunsaturated, sources.	9	Chalk and talk, PPT, On the spot Test
5	Unit –V Vitamins: Fat soluble –A,D,E and K ,water soluble –B ₁ ,B ₂ ,B ₃ ,B ₆ ,B ₁₂ , folicacid,biotin and C functions, sources, deficiency. Minerals: Classification, functions, sources and deficiencies - calcium, phosphorus, iron, iodine, zinc,sodium,potassium, and magnesium.	15	Chalk and talk, PPT, On the spot Test, Assignment

Course Designers:**(MRS)P.TAMILARASI****(MRS) B. RUBARANI**

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Generic Elective Course	22OUNDGEND3	GEC : Bakery	4	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Objectives:

To enable the students to

1. Understand the basic concepts of bakery and food preservation.
2. Familiarize with baking processes and operations.
3. Develop skills and techniques in baking.

Unit - I

Bakery principles: Introduction to bakery, baking principles, role of wheat flour in bakery products, types of flour, composition of flour, characteristics of good quality flour, flour test.

Unit - II

Functions of ingredients in baking: yeast, eggs, sugar, fats, milk products, emulsifiers, enzymes, cream and leavening agents, water, salt, flavouring and colouring materials.

Unit - III

Bread making methods: Commercial bread making methods- sponge, straight dough, ferment dough.

Baking process: Flying fermentation, mixing, bulk fermentation, knock back, dividing and rounding, intermediate proofing, moulding and panning, final proofing, depanning, cooling, slicing, packing.

Unit – IV

Pastry making: principles of pastry making, types – puff, flaky, philo and vegetables.

Cakes: types-sponge, plain cake, cake faults and their remedies, types of icings-butter and royal.

Unit – V

Chocolate and confectionaries: Types of chocolate-white, ruby, milk and dark chocolate, candies, fondant and fudge.

Books for Study:

- 1.Srilakshmi, B. *Food Science*, New Age International (P) Ltd, Publishers, 2006.
- 2.Yogambal Sivalingam, *Theory of Bakery and Confectionery* Visaga Publication, 2005.

Books for Reference:

- 1.Dubey S. *Bakery*, Wheat Associates of India, 1979.
- 2.Malik ,R.K.and Dhingra,K.C. *Technology of Bakery products*, Modern Bakery industries, Small Industry Research Institute, New Delhi, 1981.
- 3.Matz, S.A *Bakery Technology*, Packaging, Nutrition, Product Development and Quality Assurance, Elsevier, Science publisher Limited, New York, USA, 1989.
- 4.Thangam E. Philip *Modern Cookery* (Vols I and II), Orient Long Man, Mumbai, 1999.
- 5.Wade, P. *Biscuits, cookies and cracker*, Vol. 1., Elsevier Applied science publishers Ltd., New York, USA, 1988.

Web Resources / E.Books:

1. <https://www.niir.org> > blog > baking-science-with-for...
2. <https://www.sanfoundry.com> > best-reference-books-f...
3. <https://books.google.com> > ... > Food Industry
4. <https://www.pearsonhighered.com> > preface
5. <https://uou.ac.in> > sites > default > files > slm

Pedagogy:

Chalk and Talk,PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs.

Rationale for nature of Course:**Knowledge and Skill:**

- To gain knowledge regarding the baking principles,flour types and quality of flours.
- To know about the baking process, Pastry making and chocolate and confectionaries.

Activities to be given:

Innovation recipes. Assignment, ppt, Quiz, Group discussion, collect different cereals and pulses.

Course learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge (According to Bloom's Taxonomy)
CLO1	Explain the composition of wheat and wheat products	K1 to K3
CLO2	Describe the functions of the basic ingredients used in bakery goods.	K1 to K3
CLO3	Explain the different mixing techniques in baking processes and fermentation methods	K1 to K4
CLO4	Demonstrate the principles of pastry, cakes and icing techniques	K1 to K3
CLO5	Identify and explain various types of chocolate and confectionaries	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	1	2	3	1	3	2
CLO2	1	3	2	2	1	2
CLO3	2	2	1	3	3	2
CLO4	3	3	2	2	2	2
CLO5	2	2	3	3	2	2

1-Basic Level 2- Intermediate Level 3- Advanced Level

LESSON PLAN : TOTAL HOURS(60 HRS)

Unit	Description	Hrs	Mode
1	Unit – I Introduction to bakery, baking principles, role of wheat flour in bakery products, types of flour, composition of flour, characteristics of good quality flour, flour test.	12	Chalk and talk, Group Discussions, Quiz
2	Unit – II. Functions of ingredients in baking-yeast, eggs, sugar, fats, milk products, emulsifiers, enzymes, cream and leavening agents, water, salt, flavouring and colouring materials	9	Chalk and talk, Quiz
3	Unit – III Commercial bread making methods- sponge, straight dough, ferment dough. Baking process: Flying fermentation, mixing, bulk fermentation, knock back, dividing and rounding, intermediate proofing, moulding and panning, final proofing, depanning, cooling, slicing, packing	15	Chalk and talk, PPT, On the spot Test
4	Unit –IV Pastry making - principles of pastry making, types – puff, flaky, philo and vegetables. Cakes – types-sponge, plain cake, cake faults and their remedies, types of icings-butter and royal.	9	Chalk and talk, PPT, On the spot Test
5	Unit-V chocolate and confectionaries: Types of chocolate-white, ruby, milk and dark chocolate, sugar confectionaries.	15	Chalk and talk, PPT, On the spot Test, Assignment

Course Designers:**(MRS). B. RUBARANI**

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Core	22OUND41	Core : Nutritional Biochemistry	4	4	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Objectives :

To enable the students to

1. Study the basic concepts of metabolism of proximate principles .
2. To Learn the metabolic pathways of nutritional significance.

Unit - I

Carbohydrates

Properties of Carbohydrates, Structure– glucose,fructose,galactose,maltose,lactose,sucrose, starch,glycogen,dextrin. Metabolism - glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, Kreb's cycle, HMP shunt, blood sugar regulation.

Unit - II

Protein

Properties of Protein, Proteins- structure, Amino acids – structure and classification
Nucleic acids -structure and biological functions. Metabolism-General pathway of amino acid, transamination, deamination, decarboxylation, urea cycle.

Unit - III

Lipids

Properties of lipids,Lipids-classification, Fatty acids- types, Metabolism - β oxidation, bio synthesis of fatty acids.

Unit – IV

Enzymes and co-enzymes Enzymes-Definition, classification, mechanism of enzyme action, factors affecting enzyme activity. Co-enzymes –Definition, classification, some common co-enzymes.

Unit – V

Hormones

Biological role - pituitary, adrenal cortex and medulla, thyroid, parathyroid and pancreas

Hormone disorder- menopause, addison's disease and cushing's disease.

Text Books :

- 1.AmbigaShanmugam, *Fundamentals of Biochemistry for Medical Students*,Karthick offset printers, Chennai, 2015.
- 2.Arumugam N et al., *Biochemistry*, Saras Publication, Nagerkoil, 2014.
- 3.Veerakumar L, *Biochemistry*,MJPPublisher,Chennai, 2010.

Reference Books :

- 1.Chopra H.K et.al, TM, *Food chemistry* (1stedn), Narosa Publishing House, New Delhi, 2015.
2. Lajja Das,*Clinical Biochemistry*(1stedn), Venu Books Publishers &Distributors,New Delhi, 2014.
- 3.PatriciaTrueman, *Nutritional Biochemistry*(1stedn), MJP Publishers Chennai 2012.
- 4.Rastogi S C *Biochemistry*(3rdedn), Tata McGraw Hill Education Private Limited, New Delhi,2013.
- 5.Satyanarayan.S et.al*Fundamentals of Biochemistry*,(1stedn),Books and Allied (P) Ltd, Kolkata,2011.

Web Resources / E.Books:

https://en.wikipedia.org/wiki/Carbohydrate_metabolism

<https://courses.lumenlearning.com/suny-ap2/chapter/protein-metabolism/>

<https://courses.lumenlearning.com/suny-ap2/chapter/lipid-metabolism/>

<https://byjus.com/biology/enzymes/>

<https://www.news-medical.net/health/What-are-Hormones.aspx>

Pedagogy:

Chalk and Talk, PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs.

Rationale for nature of Course:**Knowledge and Skill:**

To gain knowledge regarding the biochemical changes in nutrient metabolism.

To know about the biological role of hormones.

Activities to be given:

Assignment, ppt, Quiz, Group discussion.

Course learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge (According to Bloom's Taxonomy)
CLO1	Explain metabolism and regulation of carbohydrate, lipids and proteins.	K1 to K3
CLO2	Analyze the integration of protein metabolism.	K1 to K3
CLO3	Discuss about the metabolism and regulation of lipids.	K1 to K4
CLO4	Describe the role of enzymes and co enzymes in biological oxidation.	K1 to K3
CLO5	Analyze the biological role of hormones.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	3	2	2	2	2	2
CLO2	3	2	2	2	2	2
CLO3	3	3	1	2	2	2
CLO4	3	2	2	2	2	2
CLO5	3	2	2	2	2	2

1-Basic Level 2- Intermediate Level 3- Advanced Level

LESSON PLAN: TOTAL HOURS (60 HRS)

Unit	Description	Hrs	Mode
1	Unit - I Carbohydrates Properties of Carbohydrates Structure -glucose, fructose, galactose , maltose, lactose, sucrose, starch, glycogen, dextrin. Metabolism - glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, Kreb's cycle, HMP shunt, blood sugar regulation.	12	Chalk and talk, Group Discussions, Quiz
2	Unit - II Protein Properties of Protein, Proteins- structure Amino acids – structure and classification Nucleic acids -structure and biological functions. Metabolism-General pathway of amino acid, transamination, deamination, decarboxylation, urea cycle.	15	Chalk and talk, Quiz
3	Unit - III Lipids Properties of lipids, Lipids-classification, Fatty acids-types, Metabolism - β oxidation, bio synthesis of fatty acids.	15	Chalk and talk, PPT, On the spot Test
4	Unit – IV Enzymes and co-enzymes Enzymes-Definition,classification,mechanism of enzyme action,factors affecting enzyme activity. Co-enzymes –Definition, classification, some common co-enzymes.	9	Chalk and talk, PPT, On the spot Test
5	Unit – V Hormones Biological role -pituitary, adrenal cortex and medulla, thyroid, parathyroid and pancreas . Hormone disorder- menopause, addison's disease and cushing's disease.	9	Chalk and talk, PPT, On the spot Test, Assignment

Course Designers:**(MRS). K. GOWSALYA**

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CI A	SE	Total
II	Core	22OUND4P	Core :Lab – in - Nutritional Biochemistry	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Contents:

Unit - I Qualitative tests for sugars-glucose, fructose, lactose, maltose and glucose.

Unit - II Qualitative analysis of minerals.

Unit -III Quantitative estimation of reducing sugars in foods (glucose, lactose by Benedicts method).

Unit - IV Quantitative estimation of ascorbic acid content of foods by titrimetric method.

Unit - V Quantitative estimation of lactose content of foods by titrimetric method.

Text Books :

- 1.AmbigaShanmugam, *Fundamentals of Biochemistry for Medical Students*, Karthick offset printers, Chennai, 2015.
- 2.Arumugam N et al., *Biochemistry*, Saras Publication, Nagerkoil, 2014.
- 3.Geetha swaminathan et al., *Laboratory chemical methods in food analysis*, Chennai 2002.
- 4.Veerakumar L, *Biochemistry*, MJPPublisher, Chennai, 2010.

Reference Books :

- 1.Chopra H.K et.al, TM, *Food chemistry* (1stedn), Narosa Publishing House, New Delhi, 2015.
2. Lajja Das, *Clinical Biochemistry* (1stedn), Venu Books Publishers&Distributors New Delhi 2014.
3. PatriciaTrueman, *Nutritional Biochemistry*(1stedn), MJP Publishers Chennai 2007.
4. Rastogi S C *Biochemistry*(3rdedn), Tata McGraw Hill Education Private Limite New Delhi,2010.
5. Satyanarayan.S et.al *Fundamentals of Biochemistry*,(1stedn), Books and Allied(P)Ltd, Kolkata,2012.

Web Resources:

<https://byjus.com/chemistry/benedicts-test/#:>

<https://microbiologyinfo.com/benedicts-test-principle-composition-preparation-procedure-and-result-interpretation>.

Pedagogy

Articulate, Demo, Titrimetric method

LESSON PLAN: TOTAL HOURS (30 HRS)

Unit	Description	Hrs	Mode
1	Unit - I Qualitative tests for sugars-glucose, fructose, lactose, maltose and glucose.	10	Demonstration
2	Unit - II Qualitative analysis of minerals.	4	Demonstration
3	Unit -III Quantitative estimation of reducing sugars in foods (glucose, lactose by Benedicts method).	6	Demonstration
4	Unit - IV Quantitative estimation of ascorbic acid content of foods by titrimetric method.	4	Demonstration
5	Unit - V Quantitative estimation of lactose content of foods by titrimetric method.	6	Demonstration

Course Designers:**(MRS). K. GOWSALYA**

EVALUATION (PRACTICAL)

Internal (Formative):40marks

External (Summative):60 marks

Question paper pattern for Internal Practical Examination: 40Marks

S.No	Components	Marks
1	Experiment Theory	10
2	Experiment Lab	10
3	Calculation	5
4	Observation note book	5
5	Model Exam	10
	Total	40

Question paper pattern for External Practical Examination: 60 Marks

S.No	Components	Marks
1	Experiment Theory	10
2	Experiment Lab	10
3	Calculation	15
4	Observation note book	10
5	Model Exam	15
	Total	60

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CIA	SE	Total
III	Generic Elective Course	22OUNDGEND4	GEC : Food Preservation	4	6	25	75	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Objectives

Objectives:

To enable the students to

1. Gain knowledge on principles of food preservation of foods.
2. Understand the techniques used in processing foods to preserve their shelf life.
3. Apply skills learnt to develop preserved food product.

Unit - I

Food Preservation -meaning and needs, principles of preservation. Food Preservatives - meaning, types –class I and class II preservatives. Uses of HACCP in food preservation.

Unit-II

Preservation by use of Low Temperature - types – refrigeration, Slow, quick, dehydro freezing, effect of freezing on nutritive value.

Preservation by use of High Temperature - principles, types of pasteurization, steam sterilization, canning – process, types of Spoilage in canned Foods.

Unit – III

Preservation by dehydration - principles, treatment, methods – freeze, sun, spray, foam mat and drying by smoking.

Unit-IV

Preservation of food by high concentration sugar and salt –

preparation-jam, jelly, sauces, squashes, crushes, marmalades. types of pickles- tomato, lime and green chillies.

Unit – V**Preservation of food by irradiation- meaning, uses, effect of nutritive value. Fermented**

beverages-wine, beer, rum and vinegar, Toddy & Fenny.

Text Books:

1. B.Sivasankar Food Processing and preservation, PHI Pub, New Delhi, 2015.
2. B.Srilakshmi, Food Science, New Age International (P) Ltd, Publishers,. New Delhi,2022

Reference Books:

- 1.MohiniSethi&EranS.Rao food science – experiments and applications. CBS publishers, NewDelhi,2015.
- 2.ShakuntalaManay&ShadaSharaswamy Food; Facts and Principles, Wiley Esatern Co, New Delhi, 2015.
- 3.Srilakshmi.B Food Science-Laboratory manual, Scitech Pub PvtLtd,Chennai, 2020.
- 4.UshaChandrasekaran Food Science and its application to Indian Cookery, Phoenix Pub, New Delhi, 2013.

Web Resources / E.Books:

<https://byjus.com/biology/food-preservation-methods-food-poisoning/>
https://www.brainkart.com/article/Preservation-of-Foods-with-Low-Temperature_33478/
<http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111436>
<https://www.healthline.com/nutrition/dehydrated-food>
<https://www.betterhealth.vic.gov.au/health/healthyliving/food-irradiation>

Pedagogy:

Chalk and Talk,PPT, group discussion , OHP presentations, quiz, on the spot test and Virtual Labs.

Rationale for nature of Course:**Knowledge and Skill:**

To gain knowledge regarding preservation methods.
 To know about the principles of food preservation.

Activities to be given:

Assignment, ppt, Quiz, Group discussion

Course learning Outcomes (CLO's):

CLO	Course Outcomes Statement	Knowledge (According to Bloom's Taxonomy)
CLO1	Define and explain the principles of food preservation.	K1 to K3
CLO2	Apply the various techniques of food preservation to preserve different foods to increase the shelf life of foods.	K1 to K3
CLO3	Compare the principles and techniques of various food preservation methods.	K1 to K4
CLO4	Explain the preparation techniques of preserved food items.	K1 to K3
CLO5	Analyze the fermented beverages.	K1 to K4

Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO1	2	2	2	1	1	1
CLO2	3	2	3	1	3	1
CLO3	2	2	2	2	2	1
CLO4	3	3	3	2	1	1
CLO5	3	3	3	3	1	1

1-Basic Level 2- Intermediate Level 3- Advanced Level

LESSON PLAN: TOTAL HOURS(60 HRS)

Unit	Description	Hrs	Mode
1	Unit - I Food Preservation -meaning and needs, principles of preservation.Food Preservatives - meaning, types – class I and class II preservatives. Uses of HACCP in food preservation.	12	Chalk and talk, Group Discussions, Quiz
2	Unit-II Preservation by use of Low Temperature - types – refrigeration, Slow, quick, dehydro freezing, effect of freezing on nutritive value. Preservation by use of High Temperature - principles, types of pasteurization, steam sterilization,canning– process, types of Spoilage in canned Foods.	9	Chalkand talk, Quiz
3	Unit – III Preservation by dehydration - principles , treatment, methods – freeze, sun, spray, foam mat and drying by smoking.	15	Chalk and talk, PPT
4	Unit-IV Preservation of food by high concentration sugar and salt –preparation-jam, jelly, sauces, squashes,crushes, marmalades. Types of pickles- tomato, lime and green chillies.	9	Chalk and talk, PPT
5	Unit – V Preservation of food by irradiation- meaning, uses, effect of nutritive value . Fermented beverages -wine, beer, rum and vinegar, Toddy & Fenny.	15	Chalk and talk, PPT, Assignment

Course Designers:**(Mrs).K.GOWSALYA****Mrs).P.TAMILARASI**

Department of N&D				Class : II N&D				
Sem	Category	Course Code	Course Title	Credits	Contact Hours / Week	CI A	SE	Total
II	Core	22OUNDGEND4P	GEC I : Practical - I Bakery and Food Preservation	2	2	40	60	100

Nature of the Course		
Knowledge and Skill Oriented	Employability Oriented	Entrepreneurship oriented
✓		

Course Contents:

Unit – I

Preparation of jams, jellies and squashes using seasonal fruits and vegetables.

Unit – II

Preparation of pickles using fruits and vegetables, preparation of sauce and ketchup.

Unit – III

Preparation of various types of bread rolls.

Unit – IV

Preparation of cakes – plain cake, sponge cake, cupcake, pan cake.

Unit – V

Preparation of custard, pudding and doughnuts.

Preparation of cookies and biscuits, pizza.

Text Books:

- 1.B.Sivasankar Food Processing and preservation, PHI Pub, New Delhi, 2015 .
- 2.B.Srilakshmi ,Food Science, NewAgeInternational (P) Ltd, Publishers,NewDelhi,2020.
- 3.Yogambal Sivalingam,*Theory of Bakery and Confectionery* Visaga Publication,2015.

Reference Books:

- 1.MohiniSethi&EranS.Rao food science – experiments and applications. CBS publishers, New Delhi,2019.
- 2.ShakuntalaManay&ShadaSharaswamy Food; Facts and Principles, Wiley Esatern Co, New Delhi,2015.
- 3.Srilakshmi.B Food Science-Laboratory manual, Scitech Pub PvtLtd,Chennai, 2020.
- 4.UshaChandrasekaran Food Science and its application to Indian Cookery, Phoenix Pub, New Delhi, 2012.

Web Resources:

<https://food.unl.edu/jams-jellies-and-preserves>

<https://www.allotment-garden.org/recipe/jam-jellies-marmalade/jam-and-jelly-making-method/>

Pedagogy

Articulate, demo, method of cooking and preparation.

LESSON PLAN : TOTAL HOURS(30 HRS)

Unit	Description	Hrs	Mode
1	Unit – I Preparation of jams, jellies and squashes using seasonal fruits and vegetables.	10	Demonstration and preparation
2	Unit – II Preparation of pickles using fruits and vegetables, preparation of sauce and ketchup.	4	Demonstration and preparation
3	Unit – III Preparation of various types of bread rolls.	6	Demonstration and preparation
4	Unit – IV Preparation of cakes – plain cake, sponge cake, cupcake, pan cake.	4	Demonstration and preparation
5	Unit – V Preparation of custard, pudding and doughnuts. Preparation of cookies and biscuits, pizza.	6	Demonstration and preparation

Course Designers:**(Mrs).K.GOWSALYA**

EVALUATION (PRACTICAL)

Internal (Formative):40marks

External (Summative):60 marks

Question paper pattern for Internal Practical Examination: 40Marks

S.No	Components	Marks
1	Menu planning	5
2	Experimental cookery	5
3	Menu preparation	5
4	Menu display	10
5	Observation note book	5
6	Model exam	10
	Total	40

Question paper pattern for External Practical Examination: 60 Marks

S.No	Components	Marks
1	Menu planning	10
2	Experimental cookery	10
3	Menu preparation	15
4	Menu display	10
5	Observation note book	10
6	Model exam	5
	Total	60