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2020-21

Dr G R DAMODARAN COLLEGE OF SCIENCE (AUTONOMOUS)
COIMBATORE - 641014
B.Sc. (BIOTECHNOLOGY)
CAREER ORIENTED COURSE - AGRO INDUSTRIAL BIOCHEMISTRY
(Under Choice Based Credit System)

EFFECTIVE FOR THE STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2020-2021

Programme Outcome	
PO1	CAREER SKILLS This program aim to provide students with specific knowledge and skills relevant to their discipline and careers
PO2	PROFESSIONAL APPLICATIONS Complete programme focuses on the utilization of their knowledge, understanding and skills to work successfully in a professional or business house
PO3	UPDATION OF SKILLS The broader perspective of this programme offers a number of value based and job oriented courses which ensure that the students are trained into up-to-date.
PO4	PROBLEM SOLVING SKILLS In advanced application and entrepreneurial courses beyond the introductory level, provide students with the analytical, evaluative and problem-solving skills that commensurate with degree level higher education
PO5	SUSTAINABLE DEVELOPMENT Comprehend the influence of the proficient clarifications in societal and environmental context for sustainable development
PO6	MULTIDISCIPLINARY SKILLS Exhibit comprehension and understanding of the programmes and apply them in a multidisciplinary environment.
PO7	EXPERIMENTAL TECHNIQUES The students are trained in a breadth and depth of experimental techniques using modern instrumentation which help them to take up higher education or jobs after the course.
PO8	ENTREPRENEURIAL SKILLS This program could provide well trained professionals for the algal industries, diary industries, poultry, mushroom production, food industries, agri marketing etc., to meet the well trained manpower requirements
PO9	SENSIBLE EXPOSURE Students would gain a thorough grounding in the fundamentals of opportunities in life science which offers a number of specializations and practical exposures for the students to face the modern-day challenges in different professional bodies
PO 10	LIFE LONG LEARNING Be familiar with the need for and have the training and skill to engage in self-regulating and life-long learning in the broadest perspective of hi-tech change.

Programme Specific Outcome	
PSO1	To enable students to learn principles and concepts of different areas of life sciences in business perspective as well as to acquire the knowledge for its practical applications
PSO2	To develop the students to be aware on the recent career oriented fields in life science in conformity with the provisions of the day to day market
PSO3	To inculcate practical skills related with different business in life sciences
PSO4	To get acquainted with the procedure of preparation and setting up of agri based business
PSO5	Students will have a broad foundation in the three major subjects of their choice with scientific reasoning, problem solving and analytical skills required for agri based business



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SCHEME OF EXAMINATIONS

Sem.	Part@	Course Code	Course Name	MARKS			Hrs./Week	Exam Duration (Hrs.)	Category
				CA	TEE	TOTAL			
I	CL	20311A1	Plant Propagation Practices	25	75	100	3	3	THEORY
II	CL	20311B1	Algal Technology	25	75	100	3	3	THEORY
II	CL	20311P1	Lab in Agro Industrial Biochemistry	40	60	100	3	3	PRACTICAL
III	DL	20311C1	Agro Industrial Practices	25	75	100	3	3	THEORY
IV	DL	20311D1	Mushroom Cultivation	25	75	100	3	3	THEORY
IV	DL	20311Q1	Lab in Agro Industrial Practices	40	60	100	3	3	PRACTICAL
V	ADL	20311E1	Agri Marketing and Management	25	75	100	3	3	THEORY
VI	ADL	20311F1	Food Preservation, Processing and Food Safety	25	75	100	3	3	THEORY
VI	ADL	20311R1	Lab in Food Preservation and Food Processing	40	60	100	3	3	PRACTICAL

@ CL - Certificate level ; DL - Diploma Level and ADL - Advanced Diploma Level

MAPPING OF COURSES WITH PROGRAMME OUTCOME LEVELS

Course Code	Course Title	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010
20311A1	Plant Propagation Practices	2	1	3			2		2		2
20311B1	Algal Technology	2	2	2			2	2	2		2
20311P1	Lab in Agro Industrial Biochemistry										
20311C1	Agro Industrial Practices	2	3	2	3	1	1	2	1	2	1
20311D1	Mushroom Cultivation	3		3	2	3	2	3	3	3	2
20311Q1	Lab in Agro Industrial Practices										
20311E1	Agri Marketing and Management	3	2	2	2	1	2	1	1	1	
20311F1	Food Preservation, Processing and Food Safety	2		3			2	2	1	3	1
20311R1	Lab in Food Preservation and Food Processing										

Indicators: 1. Reasonable 2. Significant 3. Strong

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Semester & Level	Course Code	Course Title	Theory/ Practical	Problems %	Theory %
FIRST CL	20311A1	PLANT PROPAGATION PRACTICES	Theory	-	100

Objective of the Course: Plant propagation is the process which grows new plants from a variety of sources: seeds, cuttings, and other plant parts. Plant propagation can also refer to the man-made or natural dispersal of seeds.

UNIT I: History and scope of Propagation

Need and potentialities for plant multiplication, Sexual and asexual methods of propagation, advantages and disadvantages. Seed dormancy (scarification & stratification) internal and external factors, nursery techniques, apomixes – mono-embryony, polyembryony, chimera & bud sport.

UNIT II: Propagation Structures

Mist chamber, humidifiers, greenhouses, glasshouses, cold frames, hot beds, poly-houses, nursery (tools and implements). Growth regulators in seed and vegetative propagation.

UNIT III: Propagation techniques

Seed propagation, Vegetative Propagation. Methods and techniques of cutting, layering, grafting and budding. Physiological & bio chemical basis of rooting. Factors influencing rooting of cuttings and layering, graft incompatibility.

UNIT IV: Vegetative Propagation techniques

Anatomical studies of bud union, selection and maintenance of mother trees, collection of scion wood stick, scion-stock relationship, and their influences, bud wood certification, techniques of propagation through specialized organs, corm, runners, suckers.

UNIT V: Smart Farming Technologies

Micro-propagation, Bulb propagation, Micro-grafting, hardening of plants in nurseries, Hydroponics.

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Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	Students will acquire knowledge about the importance of plant propagation techniques, merits and demerits and Horticultural significance.	K1&K2
CO2	Through this course students should know about the propagation structures, nursery tools and implement.	K3 &K5
CO3	Students will learn about the vegetative propagation techniques such as budding, layering, cutting and grafting and to know about the influencing factors.	K3 &K5
CO4	Students can know about the Horticultural techniques like selection of mother trees and bud wood certification etc.	K2& K3
CO5	This course make the students to apply their knowledge in Smart Farming Technologies such as Plant tissue culture and Hydroponics.	K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	3			2		2		2
CO2	1		2	2			3	3		3
CO3	2	2	3			1	2	2		2
CO4	2	2			2			3	3	
CO5	2	2				2	3			2

Indicators: 1. Reasonable 2. Significant 3.Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Plant Propagation Principles and Practices	HudsonT.Hartmann, Dale, Kester,DavisandGeneve	Prentice Hall International .Inc	2001 & Second
2	Seeds of woody plants in North America	Young, JA and Young C G	Dioscorides Press	1992 & Second
Reference Books				
S.No.	Title	Author	Publishers	Year of Publications
1	The reference annual of woody plant propagation: from seed to tissue cuture, Portland, Oregon.	Dirr, MA and Heuser C.W	Varsity Press	2006

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Pedagogy: Lecture, PPT presentation and Assignment

EFFECTIVE FOR THE STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2020-2021

Semester & Level	Course Code	Course Title	Theory/ Practical's	Problems %	Theory %
SECOND CL	20311B1	ALGAL TECHNOLOGY	Theory	-	100

Objective of the Course: Assessment of the potential and possible innovative solutions for Industrialization. Students should know about the carrier opportunities of Algal Products and Human welfare.

UNIT I: Classification of Algae

Outline of Fritsch classification. Criteria for algal classification. Role of pigments in classification. Details of habit, habitat and distribution of algae. Range of thallus structure and their evolution. Morphology and reproduction of algae.

UNIT II: Introduction to Algal Technology

Resource potential of algae, commercial utility of algae- food and feed, pigments, pharmaceuticals and nutraceuticals, fine chemicals, fuel and biofertilizers, seaweeds extracts as biofertilizers, distribution of economically important algae in India

UNIT III: Algal Biotechnology

Qualitative (product improvement, strain improvement) and quantitative (yield) improvement in economically important algae like Spirulina, Dunaliella, Botryococcus, Chlorella.

UNIT IV: Algal Products

SCP- Spirulina mass cultivation and its applications, biodiesel from algae, advantages over other sources of biodiesel, cultivation and extraction methods, liquid seaweed fertilizers – method of preparation and application.

UNIT V: Algae in Human welfare

Nutraceuticals; Pharmaceuticals; Biofertilizers; Bio-fuel; CO₂ sequestration and pollution control. Targeted genetic modifications: Genome shuffling and evolutionary engineering –*Chlamydomonas reinhardtii* as model organism; Application of synthetic biology in algae.

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Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	Students can acquire Knowledge about the systematic, morphology and reproduction biology of Algae	K1&K2
CO2	Students should be able to understand the commercial utility of algae and algal products.	K2&K3
CO3	Through this course students can understand the qualitative and quantitative strain improvement of various algae.	K4&K5
CO4	Students can learn about the extraction principle, preparation and application of Algal Products.	K3&K5
CO5	Students will able to understand the algal products and targeted genetic modification in Algae.	K3&K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3				3				
CO2	2	2	2			2	2	2		2
CO3	1			1		2	3			
CO4	2		2		1		3	3		
CO5	1			2			2			2

Indicators: 1. Reasonable 2. Significant 3. Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Algal Technologies	Raul Muñoz, Hardy Temmink, Anthony M. Verschoor, Peter van der Steen	IWA Publishing	2019 & First
2	Environmental Biotechnology	Bhattacharyya and Rintu Banerjee	Oxford University Press	2007

Pedagogy: Lecture, PPT presentation and Assignment

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Semester & Level	Course Code	Course Title	Theory/ Practical's	Problems %	Theory %
FIRST & SECOND CL	20311P1	LAB IN AGROINDUSTRIAL BIOCHEMISTRY	Practical	-	-

Objective of the Course: The course aims in training the students in culturing of algae and plant in using recent methodologies and also to inculcate the hands on training knowledge on basic biochemical tests

1. Physicochemical testing of Soil
2. Physicochemical testing of Water
3. Practicing different types of cuttings, layering, grafting and budding
4. Use of mist chamber in propagation and hardening of plants.
5. Hydroponics
6. Culturing of Azolla
7. Culturing of Spirulina
8. Estimation of protein content in Spirulina
9. Estimation of Chlorophyll from Algae
10. Estimation of Carotenoid content in Algae

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Course Outcome mapping with Knowledge level

Course outcome	CO Statement	Knowledge level
CO	Students can acquire knowledge on basic chemistry behind soil and water, Students will acquire knowledge about the importance of plant propagation techniques and its applications in day today practice, Students can learn about the extraction principle, preparation and application of Algal Products.	K2,K3,K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analyzing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome:

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO	3	3	3	2	3	3	2	3	1	2

Indicators: 1. Reasonable 2. Significant 3.Strong

Reference Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Plant Propagation Principles and Practices	HudsonT.Hartmann, Dale, Kester,DavisandGeneve	Prentice Hall International .Inc	2001 & Second
2	Algal Technologies	Raul Muñoz, Hardy Temmink, Anthony M. Verschoor, Peter van der Steen	IWA Publishing	2019 & First

Pedagogy: *Lecture, PPT, Demo & Hands on training*

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Semester & Level	Course Code	Course Title	Theory/ Practical	Problems %	Theory %
THIRD DL	20311C1	AGRO INDUSTRIAL PRACTICES	Theory	-	100

Objective of the Course: To gain the basic knowledge in the development and utilization of appropriate agricultural practices. To know about the different concepts and procedures of Apiculture, sericulture, dairy farming, Aqua culture and its byproducts.

UNIT I: Manures

Introduction – definition and differences between manures and fertilizers; Classification of manures; Importance of manures in soil fertility management; Farm yard manure (FYM) and green manure. **Biocompost and Vermicompost:** Compost and composting- methods of preparation of rural and urban compost; Vermiculture; Vermicomposting- techniques, factors affecting composting and cost benefit analysis. Biofertilizers and Biocontrol agents.

UNIT II: Dairy Farming

Significance and scope for dairy farming, Dairy as a sustainable and viable economic activity. Selection of breeds of cows and buffaloes - Type of animal – CB cows / Graded Buffalos. Desi / Local cow breeds, up gradation of cattle by cross breeding, selection of animals. Uses of dairy products.

UNIT III: Apiculture

Species of bees, bee keeping- traditional and modern bee keeping; Bee colonies – formation, bee products and their uses.

UNIT IV: Sericulture

Biology of mulberry silkworm; Moriculture; Mulberry silk worm rearing and harvesting of cocoons; Pests and diseases of mulberry silkworm and their management.

UNIT V: Aquaculture

History of aquaculture, seed production for fish culture, Monoculture, polyculture and integrated culture systems. Water and soil quality in relation to fish production. Systems of aquaculture - Pond culture, Pen culture, Cage culture, running water culture and zero water exchange system

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Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	Identify and choose the different types of manures and procedures for the preparation of composting methods, vermicomposting techniques.	K2
CO2	From this the students will know how to select the breeds and the uses of the dairy products	K2 & K3
CO3	This course shows the techniques of the apiculture	K3 & K4
CO4	This course shows the pests and diseases of mulberry silkworm and their management.	K5
CO5	Understand benefits and limitations types of Aquaculture and systems of aquaculture.	K1 & K2

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	1	1	2	1	2	1
CO2	3	2	2	2	1	2		1	1	
CO3	1	3	2		2		2	1	1	2
CO4	2	3	3		1	1	2	2	1	2
CO5	1	2	3	2	1	1	2	1	1	2

Indicators: 1. Reasonable 2. Significant 3.Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Environmental Microbiology	Pepper I. L and Gerba CP., Gentry T and Maier R.M	Elsevier Publications	2009 & Second
Reference Books				
S.No.	Title	Author	Publishers	Year of Publications
1	Aquaculture	Principles and Practices, Pillay. T.V.R. & M.N. Kutty	Black Well Sciences	2005

Pedagogy: Lecture, PPT presentation, Assignment

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Semester & Level	Course Code	Course Title	Theory/ Practical	Problems %	Theory %
FOURTH DL	20311D1	MUSHROOM CULTIVATION	Theory	-	100

Objective of the Course: To study the basic concepts in Mushroom cultivation, Life cycle of mushrooms, uses of mushrooms and medicinal uses and entrepreneur in mushroom cultivation.

UNIT I: Importance of mushroom

Mushroom - morphology and life cycle of *Pleurotus* and *Agaricus*, Mushroom culture- culture media, sterilization, pure culture techniques - preservation of cultures; Spawn types - mother spawn and bed spawn.

UNIT II: Techniques in mushroom breeding

Genetics and breeding of cultivated mushrooms-homothallism and heterothallism, primary and secondary control systems; Biotechnological methods for strain improvement.

UNIT III: Cultivation and Constraints

Cultivation of oyster mushroom, milky mushroom, paddy straw mushroom, button mushroom and other edible mushrooms; Problems in cultivation - weed moulds, diseases, pests and abiotic stress.

UNIT IV: Mushroom usage

Uses of mushroom as food, nutritional and pharmaceutical values; Mushroom recipes - cooking methods, value added products, pickling, instant food mixes.

UNIT V: Cost analysis and project preparation

Cost analysis and project preparation - principles of enterprise management, preparation of projects, project analysis and financial management - market survey, export procedures.

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Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	The students will understand the basic knowledge of life cycle of mushrooms and requirements for mushroom cultivation	K1 & K2
CO2	The students will understand the techniques used in mushroom cultivation and improvement in mushroom cultivation	K2, K3 & K4
CO3	The course will describe the methods for cultivation of various types of mushrooms and diseases that affect the mushrooms.	K2, K3 & K5
CO4	The students gain knowledge on various food recipes in mushrooms and nutritional and medical values of mushrooms	K3, K4 & K5
CO5	The students gain knowledge on how to become an entrepreneur in mushroom cultivation and how much cost the project of mushroom cultivation	K2, K3, K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1		3								
CO2					3		3			
CO3						3	2	3	1	
CO4							3			2
CO5			3	2	3	2	3	3	3	2

Indicators: 1. Reasonable 2. Significant 3.Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Handbook of Mushrooms	Bahl N.,	Oxford & IBH Publishing Co., Pvt. Ltd., New Delhi,	2000
2	Experiments in Microbiology, Plant Pathology, Tissue Culture and Cultivation of Mushroom	Aneja, K.R.,	Wishwa Prakasham, New Delhi,	1996
Reference Books				
S.No.	Title	Author	Publishers	Year of Publications
1	Mushroom – Production and processing Technology	Pathak Yadav Gour	Malhotra Publishing House, New Delhi,	2006
2	Mushroom Biotechnology Advances in Horticulture	Chadha K.L. and Sharma S.R.,	Malhotra Publishing House, New Delhi,	1995

Pedagogy: Lecture, Assignment

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Semester & Level	Course Code	Course Title	Theory/ Practical's	Problems %	Theory %
THIRD & FOURTH DL	20311Q1	LAB IN AGROINDUSTRIAL PRACTICES	Practical	-	-

Objective of the Course: To know about the different concepts and procedures of manure, biopesticide and mushroom production

I MANURES AND BIOPESTICIDES

1. Vermiculture – Culture of earthworms in various organic Nutrient Medium
2. Process of vermicompost production
3. Vermiwash production
4. Extraction of Coelomic fluid by Cold Shock method and Biochemical Estimation
5. Preparation of earthworm Paste by Sun- dry method and Biochemical Estimation
6. Applications of vermicompost and Vermiwash for Improved Crop Production.
7. Mass production of biofertilizers and biocontrol agents.

II MUSHROOM CULTIVATION

1. Preparation of culture media
2. Preparation of nucleus culture
3. Preparation of mother spawn
4. Preparation of bed spawn
5. Mushroom bed preparation using paddy straw
6. Mushroom bed preparation using other agricultural residues
7. Oyster mushroom – cropping, package and maintenance

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Course Outcome mapping with Knowledge level

Course outcome	CO Statement	Knowledge level
CO	Different techniques of manure and biopesticide were taken and the students are trained to prepare different types of manures and also they gain knowledge on how to cultivate mushroom. Both the topics inculcate the entrepreneur skill in manure production and mushroom cultivation	K2,K3,K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analyzing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome:

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO	3	3	3	2	3	3	2	3	1	2

Indicators: 1. Reasonable 2. Significant 3.Strong

Reference Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Environmental Microbiology	Pepper I. L and Gerba CP., Gentry T and Maier R.M	Elsevier Publications	2009 & Second
2	Mushroom – Production and processing Technology	Pathak Yadav Gour	Malhotra Publishing House, New Delhi,	2006

Pedagogy: *Lecture, PPT, Demo & Hands on training*

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Semester & Level	Course Code	Course Title	Theory/ Practical	Problems %	Theory %
FIFTH ADL	20311E1	AGRI MARKETING AND MANAGEMENT	Theory	-	100

Objective of the Course: The objective of this course is to develop an understanding of the field of marketing. The focus will be on imparting knowledge of the basic concepts, tools, and functions of marketing

UNIT I: Agricultural Marketing

Understanding agricultural markets - nature and scope, objectives of agriculture marketing, classification of markets; Role of market functionaries – market forces and price determination.

UNIT II: Marketing Functions and SCP Paradigm

Export pricing - pricing policies and practice for agribusiness; Promotional management – advertising, planning and sales promotion; Distribution management; Export packing, labeling and quality control.

UNIT III: Marketing Efficiency and Marketing Institutions

Marketing channels - definition and channels for different products; Marketing efficiency - marketing costs, margin and price; Role and objectives of marketing institution - state and central, FCI, PDS, AGMARK.

UNIT IV: Trade in Agricultural Products

Theories of trade, barriers to trade – tariff and non tariff measures; Role of institutions like UNCTAD and WTO in promoting trade in agricultural products; Free trade agreements; New EXIM policy of India, AEZs.

UNIT V: Agri business management

Special features of agribusiness – importance of agribusiness in Indian economy; Management – levels and functional areas of management, planning, staffing, directing and supervision; Laws and policies related to agri business

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Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	Understand fundamental agricultural marketing concepts, theories and principles in areas of marketing policy; of market and consumer behavior; of product, distribution, promotion and pricing decisions.	K2
CO2	Understand the role of marketing as a fundamental organizational policy process, brief view of export pricing, promotional and distributional management.	K2 & K3
CO3	Develop knowledge about the structure and functions of a marketing channel; channel design, implementation and management; and major institutional forms of marketing channels.	K3 & K4
CO4	From this they will learn about export and import of agricultural products depend on several factors such as international and domestic demand & supply situation, international & domestic prices, quality concerns and targets for exports or imports are fixed.	K5
CO5	From this the students will Initiate, organize and manage agribusiness projects efficiently and they effectively communicate and administer agribusiness units.	K1 & K2

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	2	3	1	1	2	1	2	1
CO2	3	2	2	2	1	2		1	1	
CO3	1	3	2		2		2	1	1	2
CO4	2	3	3		1	1	2	2	1	2
CO5	1	2	3	2	1	1	2	1	1	2

Indicators: 1. Reasonable 2. Significant 3. Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Environmental Microbiology	Pepper I. L and Gerba CP., Gentry T and Maier R.M	Elsevier Publications	2009 & Second
Reference Books				
S.No.	Title	Author	Publishers	Year of Publications
1	Aquaculture	Principles and Practices, Pillay. T.V.R. & M.N. Kutty	Black Well Sciences	2005

Pedagogy: Lecture, PPT presentation, Assignment

LI-17
2020-21

Dr G R DAMODARAN COLLEGE OF SCIENCE (AUTONOMOUS)
COIMBATORE - 641014
B.Sc. (BIOTECHNOLOGY)
CAREER ORIENTED COURSE – AGRO INDUSTRIAL BIOCHEMISTRY
(Under Choice Based Credit System)
EFFECTIVE FOR THE STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2020-2021

Semester & Level	Course Code	Course Title	Theory/ Practical	Problems %	Theory %
SIXTH ADL	20311F1	FOOD PRESERVATION, PROCESSING AND FOOD SAFETY	Theory	-	100

Objective of the Course: The course explores various basic and advanced methods of food processing technology

UNIT I: Food Contamination

Food contamination and controlling- microbial, chemical, physical, and allergenic contamination

UNIT II: Food Processing Industries

Food processing industries- classification of food processing industries – agriculture, horticulture, medicinal, animal husbandry and fisheries – dairy, fruits and vegetable processing.

UNIT III: Marketing and scope of the processed foods

Raw material procurement, marketing of the processed foods, distribution logistics, promotional tools, pricing techniques, branding, problems in marketing, strategies to be followed – Government policies.

UNIT IV: Food Safety and Training

Management of food safety and training – total quality management, food processing machineries, certification and marketing; Codex alimentaries – principles of HACCP.

UNIT V: Policies Related to Food Processing Industries

National and international policies profile of domestic and overseas players – Institutions – CII – CSIR
FAQ – SPS – ISO – FPO, GMP – GHP – International standards BRC, IFS, GFSI, ISO 22000, NFPA.

Course Outcome mapping with Knowledge level

Course Outcome	CO Statement	Knowledge level
CO1	This program aim to provide students with different specialization in knowledge and skills relevant to their discipline and careers and students to study the various physical, chemical agents that contaminate the food	K1 & K4
CO2	This course will exhibit and apply in a multidisciplinary environment of various food processing units and the processes of food preservation	K2, K3 & K5
CO3	The students will familiar with the marketing and have the training and skill to engage in self-regulating of food marketing and various	K2, K3 & K4

LI-18
2020-21

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	government policies	
Course Outcome	CO Statement	Knowledge level
CO4	The students will gain knowledge about grounding in the fundamentals of opportunities in food biotechnology, preservation techniques which offers a number of specializations, various quality management, food safety and the certification processes	K2, K3 &K4
CO5	The students understands the international institutions policies and standards of food processing industries	K1, K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analysing; K5 – Creating & Evaluating

Course Outcome mapping with Programme outcome

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2		3			2		1	3	1
CO2	2		2			2	1	1		
CO3								1		
CO4		1	3		2		2	1		2
CO5		1	3				3	1		3

Indicators: 1. Reasonable 2. Significant 3.Strong

Text Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Modern Technology of food processing and Agro Based industries	-	NIIR Board,New Delhi	2010 & Second
2	Food Processing in India	Kota Sreenivasa Murthy and Dasaraju.H.,	Lambert Academic Publications,New Delhi	2007
Reference Books				
S.No.	Title	Author	Publishers	Year of Publications
1	Handbook of food preservation	Shafiur Rahman M.,	Marcel Dekker Inc.,USA	1999
2	Handbook of Agro based industries	-	NPSC Board,NIIR Project Consultancy services	2012

Pedagogy: Lecture, PPT presentation, Seminar, E Books

LI-19
2020-21

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B.Sc. (BIOTECHNOLOGY)
CAREER ORIENTED COURSE – AGRO INDUSTRIAL BIOCHEMISTRY
(Under Choice Based Credit System)
EFFECTIVE FOR THE STUDENTS ADMITTED DURING THE ACADEMIC YEAR 2020-2021

Semester & Level	Course Code	Course Title	Theory/ Practical's	Problems %	Theory %
FIFTH & SIXTH ADL	20311R1	LAB IN FOOD PRESERVATION AND FOOD PROCESSING	Practical	-	-

Objective of the Course: The course explores various basic techniques used for accessing the food quality in food processing industry.

1. Introduction to Food Preservation
2. Introduction to Food Processing
3. Microbiological quality of water (MPN)
4. Microbiological quality of milk
5. Microbiological quality of packed fruit juices
6. Enumeration of Lactic acid bacteria from fermented foods
7. Thermal Destruction of microbes: TDT and TDP
8. Estimation of Protein from food sample
9. Estimation of carbohydrates from food samples
10. Effect of Cleaning and Disinfection on Microbial Load

LI-20
2020-21

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B.Sc. (BIOTECHNOLOGY)
CAREER ORIENTED COURSE – AGRO INDUSTRIAL BIOCHEMISTRY
(Under Choice Based Credit System)

Course Outcome mapping with Knowledge level

Course outcome	CO Statement	Knowledge level
CO	Students acquired knowledge about the constituents, food additives and enzymes in food processing. Students acquired the knowledge of the fundamentals of food processing. Students understand the techniques involved in the food processing and food preservation. Students acquired the skills to gain employment in the food industry and food product	K1, K2, K3, K4 & K5

Note: K1- Remembering; K2 – Understanding; K3 – Applying; K4 – Analyzing; K5 – Creating & Evaluating.

Course Outcome mapping with Programme outcome:

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO	3	3	3	2	3	3	2	3	1	2

Indicators: 1. Reasonable 2. Significant 3. Strong

Reference Books				
S.No.	Title	Author	Publishers	Publication Year & Edition
1	Handbook of food preservation	Shafiur Rahman M.,	Marcel Dekker Inc., USA	1999
2	Microbiology: A Laboratory Manual	Chad T. Welsh; James G. Cappuccino	Benjamin Cummings	2016 & Sixteenth

Pedagogy: *Lecture, PPT, Demo & Hands on training*