

SHIVAJI UNIVERSITY, KOLHAPUR - 416 004, MAHARASHTRA

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शिवाजी विद्यापीठ, कोल्हापुर - ४१६ ००४, महाराष्ट्र

दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दुरध्वनी ०२३१–२६०९०९३/९४



SU/BOS/Science/500

Date: 10/07/2023

To,

The Principal,	The Head/Co-ordinator/Director	
All Concerned Affiliated Colleges/Institutions	All Concerned Department (Science)	
Shivaji University, Kolhapur	Shivaji University, Kolhapur.	

Subject: Regarding syllabi of as per NEP-2020 under the Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the revised syllabi, nature of question paper and equivalence of degree programme under the Faculty of Science and Technology.

1.	B.ScM.Sc. Part II Nanoscience and	7.	All Faculty Under Graduate Part II		
	Technology		Environmental Studies		
2.	M.C.A. Part I (New NEP -2020)	8.	P.G. Diploma in Data Science		
3.	B.C.A. Part II	9.	P.G. Diploma in Environment Protection		
			& Management		
4.	M.C.A. Part II	10.	P.G. Diploma in Industrial Safety, Health		
			& Environment		
5.	B.Sc. Part III Food Science	11.	Diploma in Industrial Safety, Health &		
			Environment		
6.	B.Sc. Part I Drug Chemistry	12.	All Faculty UG & PG Value Added Course		
			: Intellectual Property Rights		

This syllabus, nature of question and equivalence shall be implemented from the academic year 2023-2024 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website <u>www.unishivaji.ac.in</u>)

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2023 & March/April 2024. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Dy Registrar r. S. M. Kubal

Copy to:

Cop	J 101		
1	The Dean, Faculty of Science & Technology	8	P.G. Admission/Seminar Section
2	Director, Board of Examinations and Evaluation	9	Computer Centre/ Eligibility Section
3	The Chairman, Respective Board of Studies	10	Affiliation Section (U.G.) (P.G.)
4	B.Sc. Exam/ Appointment Section	11	Centre for Distance Education

SHIVAJI UNIVERSITY, KOLHAPUR



Estd. in 1962 'A⁺⁺' Accredited by NAAC (2021) with CGPA 3.52

CHOICE BASED CREDIT SYSTEM

Syllabus For B.Sc.

Part - III

Food Science (Entire)

SEMESTER VAND VI

(Syllabus to be implemented from June-2023)

B.Sc. Part-III

Food Science (Entire)

SEMESTER V AND VI

(Syllabus to be implemented from June, 2023 onwards)

✤ Guidelines shall be as per B.Sc. Regular Program

Rules and Regulations shall be as per B.Sc. Regular Program exceptCBCSR. B. Sc. 3 Structure of Program and List of Courses.

* Preamble:

This syllabus is framed to gives ound knowledge with understanding of Food Science subject to undergraduate students of B.Sc. Food Science (Entire) Program. Students will learn Food Science as a separate course (Subject) from B.Sc. Part-I.

The goal of the syllabus is to make the study of Food Sciencemore popular, generate an interest amongst the students about the field and encourage them for higher studies including research.

Structure of Program and List of Courses are as follows

SEMESTER-V (Duration – 6 Months) **TEACHING SCHEME EXAMINATION SCHEME** THEORY PRACTICAL THEORY PRACTICAL Sr. Subjec tTitle Theory Credits Credits No. Internal Hours Hours Hours Max Mark Min Mark Hours Min Mark No. No. of S DSE-FS-E1 2 3 2.4 1 5 2 4 2 40 10 14+4=18 50 18 **Practical Examination** DSE-FS-E2 2 2 3 2.4 2 4 5 2 40 10 14+4=18 3 DSE-FS-E3 2 3 2.4 ---2 **isANNUAL** ___ ___ ------40 10 14+4=18 4 DSE-FS-E4 2 3 2.4 2 ____ ---___ ___ ___ 40 10 14+4=18 5 AECC-E 2 4 3.2 ____ ____ 2 ___ ___ ___ 40 10 14+4=18 Project -I 50 6 ---18 ------------------4 10 8 12. TOTAL 10 16 8 20 16 50 200 ___ 8 **SEMESTER-VI (Duration – 6 Months)** DSE-FS-F1 2 5 4 2 40 10 14+4=18 1 2 3 2.4 50 18 DSE-FS-F2 3 2 5 2 2 2 2.4 4 40 10 14+4=18 As per BOS Guidelines 3 DSE-FS-F3 2 3 2.4 2 40 10 14+4=18 ___ ------___ ___ 2 DSE-FS-F4 2 2.4 40 10 14+4=18 4 3 ___ ---___ ---___ AECC-F 2 14+4=18 5 4 3.2 2 40 10 ____ ___ ---____ ____ 6 Project-II ___ ------------___ 50 18 ___ 4 10 8 TOTAL 10 16 12. 8 2016 200 50 ---8 GRAND 25. 32 40 32 400 100 200 --TOTAL 6 • Student contact hours per week : 32 Hours (Min) • Total Marks for B.Sc.-III (Including English) : 700 • Theory and Practical Lectures : 48 Min. Each • Total Credits for B.Sc.-III (Semester V & VI) : • **DSE**- Discipline Specific Elective : All papers are compulsory. AECC- Ability Enhancement Compulsory Course (E & F) : English • • Practical Examination will be conducted annually for 200 Marks. • There shall be separate passing for theory, internal and practical. (A) Non-Credit Self Study Course : Compulsory Civic Courses (CCC)For Sem V: CCC - II : Constitution of India and Local Self Government (B) Non-Credit Self Study Course : Skill Development Courses (SDC) For Sem VI: SDC - II: Any one from following (vi) to (x)vi) Interview & Personal Presentation Skill, vii) Entrepreneurship Development Skill, ix) E-Banking & Financial Services, x) RTI & Human Right Education (HRE), IPR & Patents

Structure of B. Sc. Food Science (Entire) Program [Semester V& VI] <u>Structure III</u>

CBCS B. Sc. Food Science (Entire): List of courses B. Sc Food Science Part-III (Semester V & VI)

THEORY

Course code	Name of Course	Course code	Name of Course
Semester- V VI			
DSE FS-E1	Principles of Food Packaging	DSEFS-F1	Food Additives
DSE FS-E2	Snack Food Processing	DSE FS-F2	Sugar and Confectionery Processing
DSE FS-E3	Food Safety Management System	DSE FS-F3 Food Business Entrepreneurship	
DSE FS-E4	Fundamentals of Research	DSE FS-F4	Fundamentals of New Product
	Methodology		Development
AECC-E	English – III	AECC-F	English – IV

PRACTICAL

DSE FS-P8	Lab Course VIII (Based on DSE FS-E1 & DSE FS-E2)
DSE FS-P9	Lab Course IX
	(Project Phase I)
DSE FS- P10	Lab Course X (Based on DSE FS-F1 & DSE FS-F2)
DSE FS-	Lab Course XI
P11	(Project Phase-II)

B.Sc. Part III, Semester V DSE FS-E1 PRINCIPLES OF FOOD PACKAGING Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Introduction to Food Packaging	15
Package functions	
Need of Packaging	
Classification of packages-Primary, secondary & Tertiary	
Introduction of Packaging Material	
Different packaging and its properties	
Types of Packaging materials : Metal, Glass and Paper	
Unit II	
Packaging Accessories	15
Active packaging	
Controlled and modified atmospheric packaging (CAP and MAP)	
Aseptic packaging	
Packages for microwave ovens	
Biodegradable packaging	
Edible gums and coating	
Packaging Machines	
Vacuum packaging machine	
CA & MA packaging machine	
Gas Packaging machine	
Seal and Shrink packaging machine	
Form and Fill Sealing machine	
Retort pouches	
Bottling machine and carton making machine	
Different forms of packaging material	
Principles in development of safe and protective packing	
Suggested Reading:	

1. International Pvt. Ltd. New Delhi- 110 002A Handbook on Food Packaging, P.Jacob John

2. Food Packaging, Prof.NeelamKhetarpaul and Dr.DarshanPunia

3. Food Packaging, Takashi Kadoya

4. Handbook of Food Processing, Packaging and Labelling, Jerry D'souza and Jatin Pradhan

5. Aseptic Processing & Packaging of Food A Food Industry Perspective, Jairus R. D. David, Ralph H. Graves and V.R. Carlon

6. International Pvt. Ltd. New Delhi- 110 002A Handbook On Food Packaging , P.Jacob John

7. Food Packaging, Prof.NeelamKhetarpaul and Dr.DarshanPunia

8. Food Packaging, Takashi Kadoya

9. Handbook of Food Processing, Packaging and Labelling, Jerry D'souza and Jatin Pradhan 10. Aseptic Processing & Packaging of Food A Food Industry Perspective, Jairus R.D David, Ralph H. Graves and V.R. Carlon

11. Innovations in Food Packaging (second Edition), Jung H. Han

B.Sc. Part III, Semester V DSE FS-E2 SNACK FOOD PROCESSING Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Introduction to Snack Food Ingredients Importance and scope of snack food technology	15
Ingredients commonly used in snack food, their attributes and functions. Equipment and Packaging	
Equipment for frying, drying, baking, Equipment for popcorn processing. Quality Evaluation of Snack Food	
Unit II	
 Snack Food Products and Processing Potato Chips, Meat based snacks. Snacks based on popcorn, Puffed and flaked cereals, simulated potato chips, baked snacks. Nut based snacks (salted, spiced and sweetened), Savory and Farsans, Processing of Papad, Chips and Wafers Application of seasonings Indian Savory Sweets Extruded Snack Foods. Extruded Snack Foods. Extruded Snack Foods. Extruded Snack Foods. Single Screw and Twin Screw extruder, Hot and Cold Extrusion. Types of Extruded Snack food – First, Second and third generation snack food	15

Suggested Reading:

1. Snack Foods Processing, Edmud W Luaas, Lloyd W Rooney, CRC Press, 2001.

2. Advances in Food Extrusion Technology, MedeniMaskan, Aylin Altan, illustrated edition, 2016.

3. Snack Foods, R. Gordon Booth, Springer, 5th edition, 2011.

4. The Complete Technology Book on Snack Foods, Dr.Himatri Panda, NIIR Project Company

Services, 2nd edition, 2013.

B.Sc. Part III, Semester V DSE FS-E3 FOOD SAFETY MANAGEMENT SYSTEM Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
 Food safety and security. Food laws and standards – ISO 9000 and ISO 14000 Indian food laws and regulations – Prevention of Food Adulteration Act Food safety and standards act 2006 Functions of FSSAI , Enforcement of act,Food Licensing and Registration, Offences and penalties, regulations for labelling and packaging. Various Organizations in the area of Food standardization and quality Food and Agriculture organization, World Health organization, World Trade Organization United states Department of Agriculture, USFDA, Food and Drug Administration 	15
Codex Alimentations commission	
Unit II	
Definition of food safety, Importance of food safety, Hazards-Types of hazards, biological, chemical, physical hazards, Factors affecting Food Safety, Importance of Safe Food, microbiological considerations in food safety. Acute toxicity, Mutagencity and carcinogenicity, reproductive and developmental toxicity, neurotoxicity and behavioral effect Food safety Management System Voluntary Standards: BIS and AGMARK Objectives, Salient features TQM - concept and need for quality, components of TQM, HACCP ISO: 22000, FSSC, PRPs (GAP,GMP, GHP, GSP.)	15

Suggested Reading:

1. Training manual for Food Safety Regulators, Vol II- Food Safety Regulations and Food Safety Management, 2010.

2. Food Quality and Safety Systems- A training manual on Food Hygiene and the Hazard Analysis and Critical Control Point(HACCP) system, Food and Agriculture Organization of the United Nations, Rome, Publishing Management Group, FAO Information Division, 1998.

3. Quality Control for Food Industry - Krammer&Twigg

4. Food Plant Sanitation: Design, Maintenance and Good Manufacturing Practices, Michael M. Cramer, CRC Press, 3rd edition, 2013.

5. Training manual for Food Safety Regulators, Vol II- Food Safety Regulations and Food Safety Management, 2010.

6. Food Quality and Safety Systems- A training manual on Food Hygiene and the Hazard Analysis and Critical Control Point(HACCP) system, Food and Agriculture Organization of the United Nations, Rome, Publishing Management Group, FAO Information Division, 1998.

Quality Control for Food Industry - Krammer&Twigg
 Food Plant Sanitation: Design, Maintenance and Good Manufacturing Practices, Michael

M. Cramer, CRC Press, 3rd edition, 2013

B.Sc. Part III, Semester V DSE FS-E3 FUNDAMENTAL OF RESEARCH METHODOLOGY Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Basic Concepts of Research	15
Importance and scope of research in different fields of study,	
Types of research -Fundamental vs. Applied,	
Concept of researchable problem – research prioritization –selection of	
research problem, Approach to research – research process., Review of	
Literature	
Data Collection Methods	
Data collection	
Mailed questionnaire and interview schedule – structured, & unstructured,	
open ended and closed-ended questions.	
Interviewing techniques and field problems - methods of conducting survey	
Unit II	
Sampling Techniques	15
Sampling theory and sampling design – sampling error - methods of	
sampling	
Research design and techniques – Types of research design.,	
Hypothesis – meaning - characteristics - types of hypothesis –testing of	
hypothesis.	
Report Writing	
Meaning of Report,	
Types of Research Reports,	
Contents or Structure of Research reports,	
Characteristics of a good research report,	
Practical vs Academic Report,	
Importance of proof reading,	
Significance of good layout,	
Ethics in Research and Reporting	

Suggested Reading:

1. Black TR. 1993. Evaluating Social Science Research - An Introduction. SAGE Publ.

2. Creswell JW. 1999. Research Design - Qualitative and Quantitative Approaches. SAGE Publ.

3. Dhondyal SP. 1997. Research Methodology in Social Sciences and Essentials of Thesis Writing. Amman Publ. House, New Delhi.

4. Kothari CR. 2016. Research Methodology - Methods and Techniques. WishwaPrakashan, Chennai.

5. Rao KV. 1993. Research Methodology in Commerce and Management. Sterling Publ.,New Delhi. Singh AK. 1993. Tests, Measurements and Research Methods in Behavioral Sciences, Tata McGraw-Hill.

6. Black TR. 1993. Evaluating Social Science Research - An Introduction. SAGE Publ.

7. Creswell JW. 1999. Research Design - Qualitative and Quantitative Approaches. SAGE Publ.

8. Dhondyal SP. 1997. Research Methodology in Social Sciences and Essentials of Thesis Writing. Amman Publ. House, New Delhi.

9. Kothari CR. 2016. Research Methodology - Methods and Techniques. WishwaPrakashan, Chennai.

10. Rao KV. 1993. Research Methodology in Commerce and Management. Sterling Publ., New Delhi. Singh AK. 1993. Tests, Measurements and Research Methods in Behavioural Sciences, Tata McGraw-Hill.

SEMESTER V AECC E

MODULE I

A. Interview Skills
B. Enterprise - Nissim Ezekiel
MODULE II
A. E-Communication
B. The Ant and the Grasshopper – W.S. Maugham

MODULE III

A. English for Competitive Examinations

B. The Look-Out Man - Nicholas Bentley

MODULE IV

A. Forgetting Our Own History Sudha MurtyB.(i) The Butterfly –
Arun Kolatkar

(ii) For Your Lanes, My Country --Faiz Ahmed Faiz

*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR

B.Sc. Part III, Semester VI DSEFS- F1 FOOD ADDITIVE Credits 2 (Marks 50) Hours 30, 37.5 Lectures48

Unit I	Hours
Introduction of food additives.	15
Additives in food processing and preservation – classification and their	
functions,	
ADI, GRAS and naturally occurring compounds,	
Nutritional and non- nutritional food additives.	
Safety and quality evaluation of food additives and contaminants,	
International numbering system for food additives.	
Direct food additives	
Introduction to different food additive their chemistry, types and	
functions.	
Unit II	
Sweeteners- Natural and low calorie/ Non –nutritive sweeteners, Their	15
Chemistry Food Contaminants– Definition, Types,	
Food Toxicants– Definition, Types, Terminologies in Toxicology	
Acute and Chronic studies, LD50 Value	
Methods for Detection of Food Additives,	

Suggested Reading:

1.Fennema, O.R. Marcel Dekker Principles of Food Science: Part-I Food Chemistry,, New York, Ed. 1976

2. Potter, N.N. AVI Food Science, , Westport. 3rd Ed. 1978.

3. Furia T.E. Handbook of food additives. VolI and VolII, 1980

4. George A.B Encyclopedia of food coloradditives, ,VolIII; CRC Press, 1996.

B.Sc. Part III, Semester VI DSEFS- F2 SUGAR AND CONFECTIONERY PROCESSING Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Introduction to Confectionary	15
Present status and future scope of sugar and confectionery industries. Fundamentals of confectionery	
Processing of Invert sugar, Glucose syrup, High fructose corn syrup.	
Sugar based confectionery processing: High boiled sweets, Toffee,	
Fudge, and Caramel, Lozenges, fondants and chewing gums.	
Problems in confectionery products	
Unit II	
	15
Machinery and Additives in confectionery	15
Types of machinery in confectionery industry	
Quality parameters of confectionary products	
Chocolate Processing	
Cocoa processing	
Chocolate processing: Ingredients, mixing, refining, conching,	
tempering, moulding, cooling, coating.	
Problems in Chocolate processing	

Suggested Reading:

1. Yogambal Ashok kumar, Textbook of Bakery and Confectionery, Prentice Hall India Learning Private Limited, 2012.

2. William P Edwards, The Science of Sugar confectionery, Royal Society of Chemistry, 2nd edition, 2018.

3. Peter P. Greweling, Wiley, Chocolate and Confections; Formula, Theory and Technique for the Artisan Confectioner, 2nd edition, 2012.

4. Ferenc A. Mohos, Wiley-Blackwell, Confectionery and Chocolate Engineering: Principles and Applications, 2010.

5. Bakery and Confectionery, Acharya NG Ranga Agricultural University.

6. Yogambal Ashok kumar, Textbook of Bakery and Confectionery, Prentice Hall India Learning Private Limited, 2012.

7. William P Edwards, The Science of Sugar confectionery, Royal Society of Chemistry, 2nd edition, 2018.

8. Peter P. Greweling, Wiley, Chocolate and Confections; Formula, Theory and Technique for the Artisan Confectioner, 2nd edition, 2012.

9. Ferenc A. Mohos, Wiley-Blackwell, Confectionery and Chocolate Engineering: Principles and Applications, 2010.

10. Bakery and Confectionery, Acharya NG Ranga Agricultural University

B.Sc. Part III, Semester VI DSEFS- F3 FOOD BUSINESS ENTREPRENEURSHIP Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Entrepreneurship and its support system	15
Concept/ Meaning	
Need	
Qualities of an entrepreneur	
District industry centres (DICs),	
Small industrial development Bank of India(SIDBI)	
National bank for agriculture and rural development(NABARD),	
National Small Industry Corporation(NSIC),	
Khadi Village and industries commission(KVIC)	
Other revelant institutions/ organization/ NGOs at state level	
Business Planning and project report preparation	
Identification and guidance business plants Assessment,	
Procedures for registration of small scale industry,	
List of items reserved for exclusive manufacture in small scale	
industry,	
Considerations in product selection, Data collection for setting up small	
ventures	
Preliminary Project Report,	
Techno-Economic feasibility report,	
Project Viability	
Unit II	
	1.5
Managerial Aspects of Small Business	15
Principles of Management (Definition, functions of management viz	
planning, organization, coordination and control)	
Marketing Techniques,	
Legal Aspects of Small Business	
Elementary knowledge of Income Tax, Sales Tax, Patent Rules,	
Excise Rules,	
Factory Act and Payment of Wages Act,	

Suggested Reading:

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)

2. Entrepreneurship Development by CB Gupta and P Srinivasan, Sultan Chand and Sons, New Delhi

3. Environmental Engineering and Management by Suresh K Dhamija, SK Kataria and Sons, New Delhi

4. Environmental and Pollution Awareness by Sharma BR, Satya Prakashan, New Delhi

B.Sc. Part III, Semester VI DSEFS- F4 FUNDAMENTAL OF NEW PRODUCT DEVELOPMENT Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48

Unit I	Hours
Basics of Food Product Development	15
Definition, Classification of new food product	
Reason for new food, Product development-social concerns, Health	
concerns.	
Product development- Market place influences, Technological	
influences, Governmental influences	
Product life cycle	
New Product Development team, concept of market and marketing	
Steps in Food Product Development)	
Unit II	
Technology for New Product & Scale up Trials	15
Adaptable technology and sustainable technology for standardized	
formulation for process development	
Process control parameters	
Scale up production trials for new product development at lab and pilot	
scale	
Quality assessment of new developed products	
Market testing and marketing plan	
Costing and economic evaluation of developed products,	
Commercialization / product launch for marketing	

Suggested Reading:

Food Product Development, M Earle, R Earle, A Anderson, Woodhead Publishing, 2001.
 New Food Product Development: from Concept to Marketplace, Gordon W Fuller, CRC Press, 3rd edition, 2011.

3. Methods for Developing the New Food Products, FadiAramouni, Kathryn Deschenes, Desteh Publications, 2nd edition, 2017.

4. Strategies for Formulations Development: A step-by-step Guide using JMP, Ronald D. Snee, Roger W. Hoeri, SAS Institute; revised edition, 2016

5. New Food Product Design and Development: Beckley, Blackwell Publishing Oxford UK

6. Sensory and Consumer Research in Food Product Design and Development Moskowitz, Blackwell Publishing Oxford UK

SEMESTER VI

AECC F

MODULE V

A. Group Discussion

B. Evolution - Alexie Sherman Alexie

MODULE VI

A. Note Making and Note Taking

B. Gateman's Gift - R. K. Narayan

MODULE VII

A. Media Writing

B. Karma - Khushwant Singh

MODULE VII

A. Bhaurao in America – P. G.Patil

- B. (i) The Grass is Really Like Me- Kishwar Naheed
 - (ii) To Granny Tejaswini Patil

*Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT

Division of Teaching Hours 8 Modules x 15 Hours = 120 Hours

Practicals

DSE FS-P8	Lab Course VIII (Based on DSE FS-E1 & DSE FS-E2)
DSE FS-P9	Lab Course IX (Project Phase-I)
DSE FS-P10	Lab Course X (Based on DSE FS-F1 & DSE FS-F2)
DSE FS-P11	Lab Course XI (Project Phase II)

DSE FS – P8 Principles of Food Packaging, Snack Food Processing

1. Measurement of thickness of paper and paper boards

- 2. Measurement of water absorption of paper and paper boards
- 3. Measurement of bursting strength of paper and paper boards
- 4. Measurement Tear resistance of papers
- 5. Measurement of puncture resistance of paper and paperboard
- 6. Measurement of tensile strength of paper of paper boards
- 7. Determination of gas transmission rate of package films
- 8. Determination of WVTR and Gas transmission rate of film
- 9. Identification of Packaging materials
- 10. Edible packaging of Food Products (Fruits, Bread, Dairy)
- 11. Estimation of shelf life of packaged food stuff
- 12. Preparation of Papad and its quality evaluation.
- 13. Preparation of Chips and its quality evaluation.
- 14. Preparation of Flaked cereals (Poha) and its quality evaluation.
- 15. Preparation of Puffed cereals (Churmura) and its quality evaluation.
- 16. Preparation of Expanded snack and its quality evaluation.
- 17. Preparation of Roasted grains or nuts andits quality evaluation.
- 18. Preparation of Coated grains or nuts and its quality evaluation.
- 19. Preparation of instant food premixes and its quality evaluation.
- 9. Preparation of extruded snack food and its quality evaluation.
- 20. Preparation of popcorn and its quality evaluation.

DSE FS – P9 Project Phase I

DSE FS – P10 Food Additive, Sugar and Confectionary Processing

- 1. Detection/Estimation of adulterants in some foods
- 2. Determination of carotenoids content
- 3. Determination of chlorophyll content

- 4. Estimation of tannins content
- 5. Extraction of essential oils
- 6. Determination of vitamin c content
- 7. Effect of acidulants in food products
- 8. Effect of thickener in food products
- 9. Effect of natural sweeteners/ artificial sweeteners in food products
- 10. Effect of stabilizing agents in food products
- 11. Development of Invert Sugar by chemical method
- 12. Effect of a Boiling point on the solubility of sugar
- 13. Development of Jaggery based nutritious.
- 14. Development of Hard boiled candy
- 15. Development of fruit-based Toffee
- 16. Preparation of Fudge/ Fondant
- 17. Preparation of medicated lozenges
- 18. Effect of different emulsifier on chocolate quality
- 19. Preparation of caramel
- 10. Development Indian traditional sweet

DSE FS – P11 Project Phase II