

LEARNING OUTCOMES BASED CURRICULUM

JOB ROLE: SOY PRODUCTS PROCESSOR

(Ref. ID: FICSI/Q8004)

Sector: Food Processing

Grades 11 and 12

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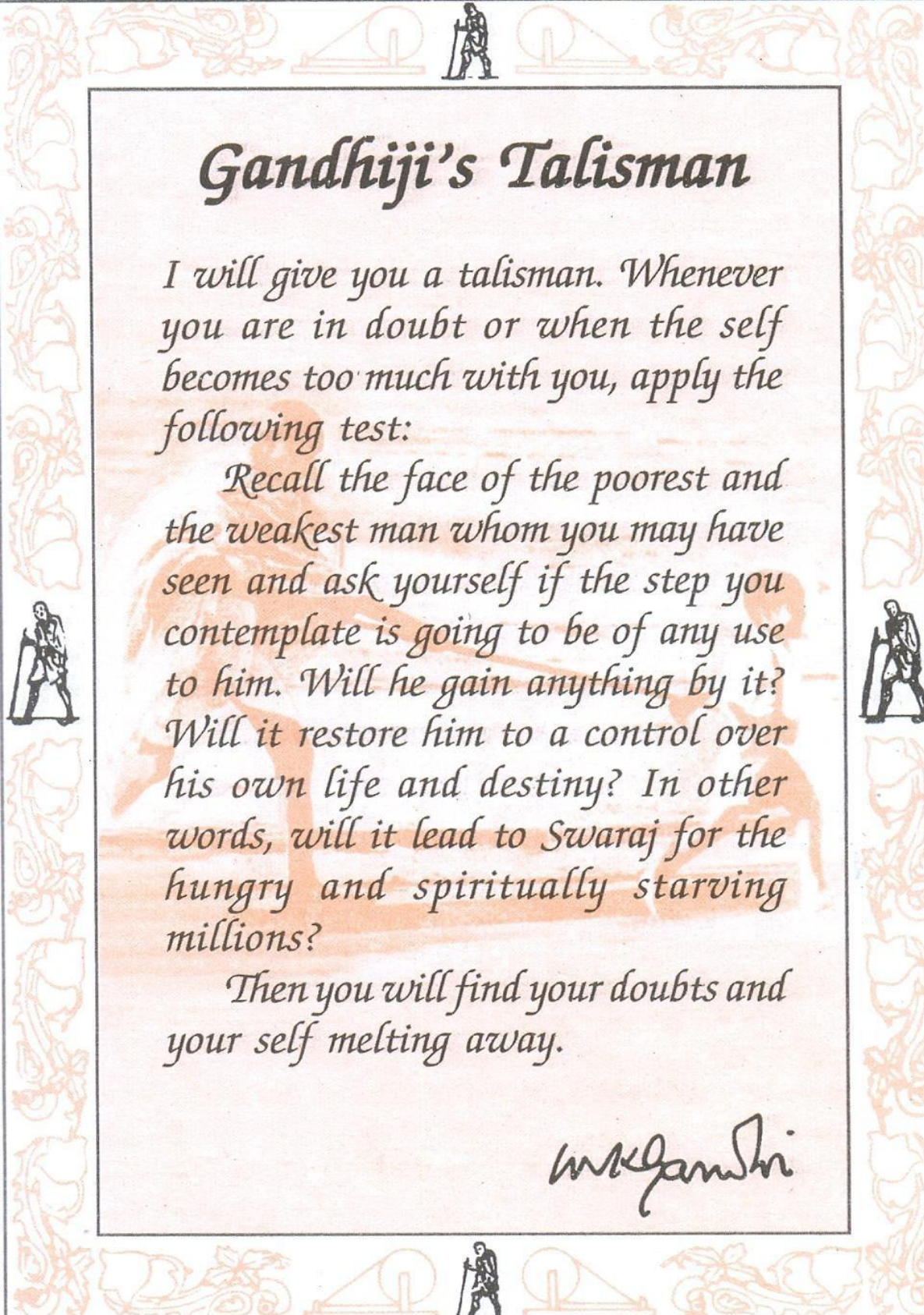
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NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under Ministry of Education, Government of India)

Shyamla Hills, Bhopal- 462 002, India

<http://www.psscive.ac.in>



Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.

M. K. Gandhi

LEARNING-OUTCOMES BASED CURRICULUM

JOB ROLE: SOY PRODUCTS PROCESSOR

(QUALIFICATION PACK: Ref. Id. FICSI/Q8004)

Grades 11 & 12



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

Shyamla Hills, Bhopal- 462 002, Madhya Pradesh, India

**LEARNING OUTCOMES BASED VOCATIONAL
CURRICULUM,
Food processing,
Soy Products Processor,
July, 2023**

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<http://www.psscive.ac.in>

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Published by:

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent unit of National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based vocational curriculum and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Vocationalisation of Education under Samagra Shiksha. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of Samagra Shiksha of Ministry of Human Resource Development (MHRD), Govt. of India.

The main purpose of the learning outcome-based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject. It is a matter of great pleasure to introduce this learning outcome-based curriculum as part of the vocational training packages for the job role of "Soy Products Processor". The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF). The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences. The curriculum has been developed and reviewed by a group of experts and their contributions are greatly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

Dinesh Prasad Saklani
Director,
National Council of Education Research and Training,
New Delhi

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfill the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop competency-based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation needs to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfill the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome-based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and courseware for over 50 job roles in various sectors, besides the curricula developed for 100 job roles

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MHRD and NCERT for the financial support and cooperation in realising the objective of providing competency based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Government of India.

Finally, for transforming the proposed curriculum design into a vibrant reality, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per amendments made in the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education system through the learner-centric curricula and courseware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st century.

Deepak Paliwal
Joint Director
PSS Central Institute of Vocational Education
Bhopal

ACKNOWLEDGEMENTS

On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of *Samagra Shiksha* and the officials of the Ministry of Education (MoE), Government of India for the financial support to the project for development of curricula.

We are grateful to the Director, National Council for Education, Research and Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of *Samagra Shiksha*, MoE, National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and Food Industry Capacity Initiatives of India (FICSI) for their academic support and cooperation in the development of curricula.

We are also grateful to Dr. R. Ravichandran, Course Coordinator, Dr. Preeti Dixit, Assistant Professor, and Dr. Jayshree Mahapatra, Assistant Professor, Department of Humanities, Sciences, Education and Research, PSSCIVE, Bhopal, and the experts Dr. Dipika Agrahar Murugkar, Principal Scientist & ICAR National Fellow, ICAR - Central Institute of Agricultural Engineering, Bhopal, M.P; Dr. Punit Chandra, Principal Scientist, Centre of Excellence on Soybean Processing and Utilization, ICAR - Central Institute of Agricultural Engineering, Bhopal, M.P; Dr. Manoj Kumar Srivastava, Principal Scientist. ICAR - Indian Institute of Soybean Research, Indore, M.P.; Mr. Sumit Kumar Agrawal, Director, Bio-Nutrient India Pvt. Ltd. Bhopal, and Mr. Nitesh Sadh, Production Manager, Bansal Foods, Bhopal, M.P., for their contributions in the development of this learning outcome-based curricula for the Job Role: Soy Products Processor for Grades 11 and 12.

The contributions made by Dr. Vinay Swarup Mehrotra and his team, at PSSCIVE in the development of the curriculum for the Employability Skills (Part-A) are also duly acknowledged.

PSSCIVE Team

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1. COURSE OVERVIEW

COURSE TITLE: SOY PRODUCTS PROCESSOR

A Soy Product Processor is responsible for performing required operations to prepare different types of soy products while maintaining their consistency and quality. S/he is able to work with various organizational departments effectively and use resources at the workplace optimally.

A Soy Product Processor must have the ability to plan, organize, prioritize, calculate and handle pressure. S/he must possess reading, writing and communication skills. In addition, the individual must have stamina to be able to stand for long hours, have personal and professional hygiene and an understanding of food safety standards and requirements.

COURSE OBJECTIVES: On completion of the course, students should be able to:

- Apply effective oral and written communication skills to interact with people and customers;
- Identify the principal components of a computer system;
- Demonstrate the basic skills of using computer;
- Demonstrate self-management skills;
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- Perform tasks for production of soy products
- Perform tasks to prepare soy flour, soy milk, tofu and produce texturized soy protein
- Apply necessary health and safety practices to ensure food safety and personal hygiene
- Demonstrate the procedure for producing soy flour, soy milk, tofu and texturized soy protein

COURSE REQUIREMENTS: The learner should have the basic knowledge of science.

COURSE LEVEL: On completion of this course, a student can take up a higher-level course for a job role in soy processing, such as Soy Beverage Making Technician.

COURSE DURATION: 600 hrs

Class11 : 300 hrs.

Class12 : 300 hrs.

Total : 600 hrs.

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Grade 11 and 12, opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Grade 11 is as follows:

GRADE 11			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1: Communication Skills – III	25	10
	Unit 2: Self-management Skills – III	25	
	Unit 3: Information and Communication Technology Skills – III	20	
	Unit 4: Entrepreneurial Skills – III	25	
	Unit 5: Green Skills – III	15	
	Total	110	10
Part B	Vocational Skills		
	Unit 1: Introduction to Soybean	25	40
	Unit 2: Processing of Soybean	45	
	Unit 3: Maintenance of Soy Processing Unit	35	
	Unit 4: Essential Elements for Soy Processing Industry	40	
	Unit 5: Food Safety and Hygiene	20	
	Total	165	
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
	Grand Total	300	100

The unit-wise distribution of hours and marks for Grade 12 is as follows:

GRADE 12			
	Units	No. of Hours for Theory and Practical 300	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1: Communication Skills – IV	25	10
	Unit 2: Self-management Skills – IV	25	
	Unit 3: Information and Communication Technology Skills – IV	20	
	Unit 4: Entrepreneurial Skills – IV	25	
	Unit 5: Green Skills – IV	15	
	Total	110	10
Part B	Vocational Skills		
	Unit 1: Extrusion Technology	45	
	Unit 2: Equipment and Machinery for Soy Processing	40	40
	Unit 3: Maintaining Food Safety and Occupational Health	25	
	Unit 4: Food Standards	20	
	Unit 5: Marketing of Soy Products	35	
	Total	165	
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
	Grand Total	300	100

3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case-based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

FIELD VISITS/ EDUCATIONAL TOUR

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

4. ASSESSMENT AND CERTIFICATION

Upon successful completion of the course by the candidate, the Central/ State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOS's), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

Knowledge Assessment should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper-based test or short structured questions based on the content of the curriculum.

WRITTEN TEST

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

Duration: 3hrs

S. No.	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	2	1	2	10
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	1	2	2	11
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	1	1	05
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	1	0	02
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
Total		3x1=3	6x2=12	5x3=15	30 (14 Question)

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency checklist should be developed as per the National Occupation Standards (NOS's) given in the Qualification Pack for the Job Role to bring about necessary consistency in the quality of assessment across different sectors and Institutions. The student has to demonstrate competency against the performance criteria defined in the National Occupation Standards and the assessment will indicate that they are 'competent', or are 'not yet competent'. The assessors assessing the skills of the students should possess a current experience in the industry and should have undergone an effective training in assessment principles and practices. The Sector Skill Councils should ensure that the assessors are provided with the training on the assessment of competencies.

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators – the subject teacher and the expert from the relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce.

Project Work (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organized as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

Student Portfolio is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the

unit of competency.

Viva voce allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the vocational subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

5. UNIT CONTENTS

GRADE 11

Part A: Employability Skills

S.No.	Units	Duration (hrs)
1.	Communication Skills- III	25
2.	Self-management Skills – III	25
3.	Information and Communication Technology Skills - III	20
4.	Entrepreneurial Skills – III	25
5.	Green Skills – III	15
	Total	110

UNIT 1: COMMUNICATION SKILLS – III			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Demonstrate knowledge of communication	1. Introduction to communication 2. Importance of communication 3. Elements of communication 4. Perspectives in communication 5. Effective communication	1. Role-play on the communication process 2. Group exercise on factors affecting perspectives in communication 3. Classroom discussion on the 7Cs of effective communication 4. Chart making on elements of communication	03
2. Demonstrate verbal communication	1. Verbal communication 2. Public Speaking	1. Role-play of a phone conversation. 2. Group exercise on public speaking	02

3. Demonstrate non-verbal communication	<ol style="list-style-type: none"> 1. Importance of non-verbal communication 2. Types of non-verbal communication 3. Visual communication 	<ol style="list-style-type: none"> 1. Role-play on non-verbal communication 2. Group exercise on body language 3. Group activity on methods of communication 	02
4. Speak using correct pronunciation	<ol style="list-style-type: none"> 1. Pronunciation basics 2. Speaking properly 3. Phonetics 4. Types of sounds 	<ol style="list-style-type: none"> 1. Group activities on practicing pronunciation 	01
5. Apply an assertive communication style	<ol style="list-style-type: none"> 1. Important communication styles 2. Assertive communication 3. Advantages of assertive communication 4. Practicing assertive communication 	<ol style="list-style-type: none"> 1. Group discussion on communication styles 2. Observing and sharing communication styles 	03
6. Demonstrate the knowledge of saying no	<ol style="list-style-type: none"> 1. Steps for saying 'No' 2. Connecting words 	<ol style="list-style-type: none"> 1. Group discussion on how to respond 2. Group activity on saying 'No' 	02
7. Identify and use parts of speech in writing	<ol style="list-style-type: none"> 1. Capitalisation 2. Punctuation 3. Basic parts of speech 4. Supporting parts of speech 	<ol style="list-style-type: none"> 1. Group activity on identifying parts of speech 2. Writing a paragraph with punctuation marks 3. Group activity on constructing sentences 4. Group activity on identifying parts of speech 	03
8. Write correct sentences and paragraphs	<ol style="list-style-type: none"> 1. Parts of a sentence 2. Types of object 3. Types of sentences 4. Paragraph 	<ol style="list-style-type: none"> 1. Activity on writing sentences 2. Activity on active and passive voice 3. Assignment on types of sentences 	02

9. Communicate with people	1. Greetings 2. Introducing self and others	1. Role-play on formal and informal greetings 2. Role-play on introducing someone 3. Practice greetings	02
10. Introduce yourself to others and write about oneself	1. Talking about self 2. Filling a form	1. Practice self-introduction and filling up forms 2. Practice self-introduction to others	01
11. Develop questioning skill	1. Main types of questions 2. Forming closed and open-ended questions	1. Practice exercise on forming questions 2. Group activity on framing questions	01
12. Communicate information about family to others	1. Names of relatives 2. Relations	1. Practice talking about family 2. Role-play on relations	01
13. Describe habits and routines	1. Concept of habits and routines	1. Discuss habits and routines 2. Group activity on describing routines	01
14. Ask or give directions to others	1. Asking for directions 2. Using landmarks	1. Role-play on asking and giving directions 2. Identifying symbols	01
Total			25

UNIT 2: SELF-MANAGEMENT-III

Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Identify and analyze own strengths and weaknesses	1. Understanding self 2. Techniques for identifying strengths and weaknesses 3. Difference between interests and abilities	1. Activity on writing aims in life 2. Prepare a worksheet on interests and abilities	03
2. Demonstrate personal grooming skills	1. Guidelines for dressing and grooming 2. Preparing a personal grooming checklist	1. Activity on dressing and grooming standards 2. Self-reflection on dressing and grooming	04

3. Maintain personal hygiene	<ol style="list-style-type: none"> 1. Importance of personal hygiene 2. Three steps to personal hygiene 3. Essential steps of hand washing 	<ol style="list-style-type: none"> 1. Role-play on personal hygiene 2. Assignment on personal hygiene 	03
4. Demonstrate the knowledge of working in a team and participating in group activities	<ol style="list-style-type: none"> 1. Describe the benefits of teamwork 2. Working in a team 	<ol style="list-style-type: none"> 1. Assignment on working in a team 2. Self-reflection on teamwork 	03
5. Develop networking skills	<ol style="list-style-type: none"> 1. Benefits of networking skills 2. Steps to build networking skills 	<ol style="list-style-type: none"> 1. Activity on networking 2. Assignment on networking skills 	03
6. Describe the meaning and importance of self-motivation	<ol style="list-style-type: none"> 1. Meaning of self-motivation 2. Types of motivation 3. Steps to building self-motivation 	<ol style="list-style-type: none"> 1. Activity on staying motivated 2. Assignment on reasons hindering motivation 	03
7. Set goals	<ol style="list-style-type: none"> 1. Meaning of goals purpose of goal-setting 2. Setting SMART goals 	<ol style="list-style-type: none"> 1. Assignment on setting SMART goals 2. Activity on developing long-term and short-term goals 	03
8. Apply time management strategies and techniques	<ol style="list-style-type: none"> 1. Meaning and importance of time management 2. Steps for effective time management 	<ol style="list-style-type: none"> 1. Checklist for making preparation for daily activities 2. Preparing To-do-list 	03
Total			25

UNIT 3: INFORMATION AND COMMUNICATION TECHNOLOGY-III

Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 hrs)
1. Create a document on the word processor	<ol style="list-style-type: none"> 1. Introduction to ICT 2. Advantages of using a word processor. 3. Work with Libre Office Writer 	<ol style="list-style-type: none"> 1. Demonstration and practice of the following: <ul style="list-style-type: none"> • Creating a new document • Typing text • Saving the text • Opening and saving file on Microsoft word/Libre Office 	02

		Writer.	
2. Identify icons on the toolbar	<ol style="list-style-type: none"> 1. Status bar 2. Menu bar 3. Icons on the Menu bar 4. Multiple ways to perform a function 	<ol style="list-style-type: none"> 1. Work with a basic user interface of LibreOffice writer 2. Working with LibreOffice Writer or Microsoft Word 	02
3. Save, close, open and print document	<ol style="list-style-type: none"> 1. Save a word document 2. Close 3. Open an existing document 4. Print 	<ol style="list-style-type: none"> 1. Perform the functions for saving, closing and printing documents on LibreOffice Writer 2. Perform the functions on Microsoft Word 	02
4. Format text in a word document	<ol style="list-style-type: none"> 1. Change style and size of text 2. Align text 3. Cut, Copy, Paste 4. Find and replace 	<ol style="list-style-type: none"> 1. Perform the functions of formatting on LibreOffice Writer 2. Perform the functions of formatting on Microsoft Word 	02
5. Check spelling and grammar in a word document	<ol style="list-style-type: none"> 1. Use of spell checker 2. Autocorrect 	<ol style="list-style-type: none"> 1. Perform the functions of checking spellings on LibreOffice Writer 2. Perform the functions of checking the spelling on Microsoft Word 	02
6. Insert lists, tables, pictures, and shapes in a word document	<ol style="list-style-type: none"> 1. Insert bullet list 2. Number list 3. Tables 4. Pictures 5. Shapes 	<ol style="list-style-type: none"> 1. Perform the functions on LibreOffice Writer 	03
7. Insert header, footer and page number in a word document	<ol style="list-style-type: none"> 1. Insert header 2. Insert footer 3. Insert page number 4. Page count 	<ol style="list-style-type: none"> 1. Perform the functions on LibreOffice Writer 2. Perform the functions on Microsoft Word 	03
8. Make changes by using the track change option in a	<ol style="list-style-type: none"> 1. Tracking option 2. Manage option 3. Compare documents 	<ol style="list-style-type: none"> 1. Perform the functions on LibreOffice Writer 	04

word document		2. Perform the functions on Microsoft Word	
Total			20

UNIT 4: ENTREPRENEURIAL SKILLS – III			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Differentiate between different kinds of businesses	1. Introduction to entrepreneurship 2. Types of business activities	1. Role-play on different kinds of businesses	03
2. Describe the significance of entrepreneurial values	1. Meaning of value 2. Values of an Entrepreneur 3. Case study on qualities of an entrepreneur	1. Role-play on qualities of an entrepreneur	03
3. Demonstrate the attitudinal changes required to become an entrepreneur	1. Difference between the attitude of entrepreneur and employee	1. Interviewing employees and entrepreneurs	03
4. Develop thinking skills like an entrepreneur	1. Problems of entrepreneurs 2. Problem-solving 3. Ways to think like an entrepreneur	1. Group activity on identifying and solving problems	04
5. Generate business ideas	1. The business cycle 2. Principles of idea creation 3. Generating a business idea 4. Case studies	1. Group activity to create business ideas	04
6. Describe customer needs and the importance of conducting a customer survey	1. Understanding customer needs 2. Conducting a customer survey	1. Conducting a customer survey	04
7. Create a business plan	1. Importance of business planning 2. Preparing a business plan 3. Principles to follow for growing a business 4. Case studies	1. Activity on developing a business plan	04
Total			25

UNIT 5: GREEN SKILLS – III			
Learning Outcome	Theory (07 hrs)	Practical (08 hrs)	Duration (15 hrs)
1. Describe the importance of the main sector of the green economy	1. Meaning of ecosystem, food chain and sustainable development 2. Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management	1. Discussion on sectors of green economy 2. Preparing posters on various sectors for promoting green economy 3. Writing an essay or a short note on the important initiatives for promoting green economy.	06
2. Describe the main recommendations of policies for the green economy	1. Policies for a green economy	1. Discussion on initiatives for promoting the green economy	03
3. Describe the major green sectors/ areas and the role of various stakeholders in the green economy	1. Stakeholders in the green economy	1. Group discussion on the role of stakeholders in the green economy 2. Preparation of posters on green sectors and their stakeholders 3. Making solar bulbs.	03
4. Identify the role of government and private agencies in the green economy	1. Role of the government in promoting a green economy 2. Role of private agencies in promoting green economy	1. Discussion on the role of Government and Private Agencies in promoting a green economy. 2. Posters on green sectors.	03
Total			15

Part B–Vocational Skills – Grade 11

S.No.	Units	Duration (Hrs)
1.	Unit 1: Introduction to Soybean	25
2.	Unit 2: Processing of Soybean	45
3.	Unit 3: Maintenance of Soy Processing Unit	35
4.	Unit 4: Essential Elements for Soy Processing Industry	40
5.	Unit 5: Food Safety and Hygiene	20
	Total	165

UNIT 1: INTRODUCTION TO SOYBEAN			
Learning Outcome	Theory 10 Hrs	Practical 15 Hrs	Duration (25 Hrs)
1. Describe aspects of soybean production and processing.	1. Soybean: Historical Background (i) World (ii) India (iii) Overview of Soybean Production (iv) World (v) India 2. Major soybean varieties grown in India.	1. Using soybean grains, locate the world's major soybean producing countries on the world map. 2. Prepare a roadmap with timeline on majorly grown varieties, area of cultivation, production and productivity of soybean in India.	6
2. Discuss the package of practices for soybean production.	1. General practices for Soybean production (i) Agronomical practices for Soybean production (ii) Harvesting and drying of Soybean (iii) Storage of Soybean	1. Visit a soybean production farm and interact with the farmer about following aspects: (i) Varieties used for production (ii) Soybean production practices (iii) Challenges faced during production (iv) Storage practices	6
3. Describe utilization practices of soybean prevailing in India.	1. Soybean Products consumption for food and feed in India 2. Traditional products of soybean 3. Innovative products of soybean (i) Isolates (ii) Concentrates (iii) Soy milk powder (iv) Plant based meat alternatives	1. Market survey (online & offline) of the soy based products and identify the components and composition 2. Prepare an exhaustive list of traditional products of soybean used around the world.	5

4. Explain about the nutritional composition of soybean.	1. Physicochemical characteristics of Soybean (i) Physical Characteristics (Seed color, size and weight) (ii) Nutritional Characteristics (Moisture, Proteins, Carbohydrates, Lipids, Fiber, Minerals, Vitamins and A-nutrients /anti-nutrients) (iii) Health Benefits of Soy	1. Physical Characteristics (i) Bulk density (ii) True density (iii) 100 grain weight (iv) Length to Breadth ratio (v) Color 1. Nutritional Characteristics (i) Moisture% (ii) % (cold extraction) (iii) Protein % (Virtual lab) (iv) Urease Test (strip method) 3. Make a chart on health benefits of soybean	8
Total			25

UNIT 2: PROCESSING OF SOYBEAN

Learning Outcome	Theory (10 hrs)	Practical (30 hrs)	Duration (40 Hrs)
1. Explain the importance of food processing.	1. Food processing: concept, history and classification	1. Identify the primary, secondary and tertiary processed products available in the market. 2. Cleaning, grading and sorting at an industrial visit/ (virtual lab)	6
2. Describe the primary, secondary and tertiary processing of soybean.	1. Soybean Processing (i) Primary processing (Cleaning, sorting and grading; dehulling and splitting; (ii) Secondary processing (grits, flour, oil and oil cake, soy milk) (iii) Tertiary processing (Tofu, isolates, concentrates, flavored soy beverages, soy ice creams and soy based products)	1. Perform cleaning to identify differences between healthy grain, broken grain, foreign material and diseased grain in your laboratory. 2. Make a flow chart for various products indicating primary, secondary and tertiary processing of soybean with example.	12
3. Demonstrate the preparation of soy flour.	1. Soy flour (i) Unit operation for household level and cottage level (ii) Equipment and machinery (iii) Packaging and shelf	1. Make soy flour at household level. 2. Urease test in different soy products 3. Make products with incorporation of 10%	6

	life (iv) Utilization for preparing soy four based products	soy flour.	
4. Explain the process of preparing soy milk.	1. Soy milk (i) Unit operation for household level and cottage level (ii) Equipment and machinery (iii) Shelf life of soy milk by pasteurization & sterilization (iv) Utilization of soy milk for different products (<i>mattha</i> , curd, flavored beverage)	1. Make soy milk at household level. 2. Urease test in soy milk 3. Make products using soy milk. 4. Video demonstration on soy milk preparation and packaging.	4
1. Explain the process of preparing tofu.	1. Tofu (i) Unit operation for household level and cottage level (ii) Equipment and machinery (iii) Packaging and shelf life (iv) Preparation of tofu-based products	1. Make tofu at household level. 2. Make products using tofu.	4
1. Describe important by- products of soy processing industry.	1. By-products of Soybean Processing 2. Different by-products and their uses. (i) Hull (ii) De-oiled cake (iii) Okara (iv) Whey	1. Make a project report on different usage of soy by-products.	8
Total			40

UNIT 3: MAINTENANCE OF SOY PROCESSING UNIT

Learning Outcome	Theory (15 hrs)	Practical (20 hrs)	Duration (35 Hrs)
1. Perform pre and post production cleaning and maintenance of the work area, equipment and tools.	1. Prepare, clean and maintain the work area for soy flour, soy milk and tofu 2. Types of Maintenance 3. Pre-production cleaning and maintenance of	1. Schematic representation of the production area. 2. Prepare cleaning solution for cleaning the work area, equipment and tools using recommended	17

	<p>equipment for soy flour, soy milk and tofu</p> <p>4. Post-production cleaning and maintenance of equipment for soy flour, soy milk and tofu</p>	<p>cleaning agents and sanitizers.</p> <p>3. Demonstrate the procedure for the disposal of waste produced from soybean processing.</p>	
2. Identify the equipment and machinery used in soybean processing.	<p>1. Equipment and machinery used in soybean processing:</p> <p>(i) Cleaning and De-hulling machine</p> <p>(ii) Drying</p> <p>(iii) Soybean grinding machine</p> <p>(iv) Vacuum packaging</p> <p>(v) Centrifuge</p> <p>(vi) Blending /mixing tank</p> <p>(vii) Pasteurizer</p> <p>(viii) Homogenizer</p> <p>(ix) Pneumatic press</p>	<p>1. Visit a nearby Soybean processing / grain processing/ milk processing to see what kind of machinery are being used there and how are they being operated and maintained.</p> <p>2. Make a presentation on unit operations of drying.</p> <p>3. Discuss with the Plant Managers about day-to-day challenges in soybean processing and do's and don'ts while working with heavy machineries.</p>	18
Total			35

UNIT 4: ESSENTIAL ELEMENTS FOR SOY PROCESSING INDUSTRY

Learning Outcome	Theory (10 hrs)	Practical (25 hrs)	Duration (35 hrs)
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1. Demonstrate the knowledge of pre-preparations for soy processing	<ol style="list-style-type: none"> 1. Identification of production requirement <ol style="list-style-type: none"> (i) Process chart (ii) Product flow chart (iii) Process technology 2. Essential elements of production: <ol style="list-style-type: none"> (i) Human resources (ii) Raw material (iii) Machinery/equipment (iv) Water and water quality (v) Techno-economical feasibility of product production 	<ol style="list-style-type: none"> 1. Make a project on production of any soy based processed products covering the following aspects: <ol style="list-style-type: none"> (i) Manpower required (ii) Assigning duties (iii) Estimate raw materials required along with quantity (iv) Supplier of the raw material (v) Time of pre-preparation (vi) Time for production (vii) Equipment and utensils required (viii) Batch size, quantity (ix) Packaging material required (x) Storage and marketing (xi) Techno-economical feasibility of product production using excel sheet 	21
2. Demonstrate the knowledge of cleaning and disinfection.	<ol style="list-style-type: none"> 1. Methods of cleaning <ol style="list-style-type: none"> (i) Cleaning-in-place (CIP) (ii) Cleaning-out-of-place (COP) 2. Sterilising-in-place (SIP) 3. Cleaning of soybean processing equipment 4. Common detergents and sanitizers used for cleaning equipment 5. Disinfection of tools and equipment 6. Precautionary measures during cleaning and sanitization 7. Solid waste management 	<ol style="list-style-type: none"> 1. Full day visit to a soybean processing unit/ plant for: <ul style="list-style-type: none"> • Demonstration of cleaning, maintaining and handling soybean processing equipment and tools. • Discussion on hygiene and sanitation standards in processing unit 	14
Total			35

UNIT 5: FOOD SAFETY AND HYGIENE			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 Hrs)
1. Describe role and functions of FSSAI.	1. Food safety laws in India: past and present scenario 2. Food Safety and Standards Authority of India (FSSAI)	1. Collect the empty packets of food products. Observe, identify and note down if any symbol related to food safety laws is printed on packaging. 2. Find out the meaning of the symbols printed on packaging of the product. 3. Visit the FSSAI website and make a report on food licensing process/ areas in which FSSAI regulates.	5
2. Describe schedule 4 of FSSAI and its importance.	1. Schedule 4 of FSSAI 2. Classification of soy food with respect to FSSAI	1. Prepare the list of chapters containing Soy foods as per the FSSAI schedule.	5
3. Explain food safety.	1. Food safety 2. Shelf life of food 3. Factors affecting food safety and shelf life of food 4. Food safety hazards 5. Types of contaminants	1. Identify and categorize food safety hazards in your food laboratory and surrounding. Suggest the measures for removal of these hazards. 2. Take sample of milk, sugar and refined wheat flour and test them for adulteration	5
4. Describe Food Safety Management Systems (FSMS)	1. Food safety practices a. Good Manufacturing Practices (GMP) b. Good handling Practices (GHP) c. Hazard Analysis Critical Control Points (HACCP) d. Other measures (Certification : Organic And Kosher)	1. Visit a nearby food/soybean processing unit and observe the area where food products are prepared and stored: (i) Identify the critical control points in the retail unit and give suggestions for improvement in this regard. (ii) Prepare a HACCP for soy flour, soy milk and tofu.	5

1. Explain the importance of personal hygiene and sanitation in soy processing unit.	1. Job responsibilities of a soy Product Processor 2. Personal Hygiene and sanitation guidelines a. Aspects of maintaining hygienic work place- waste disposal and pest control	1. Demonstration on wearing uniform including uniform, apron, gloves, hair caps, socks, shoes, etc. 2. Hand washing technique 3. Sanitization of equipment, tools and utensils.	5
Total			25

GRADE 12

Part A: Employability Skills

S.No.	Units	Duration (hrs)
1.	Communication Skills- IV	25
2.	Self-management Skills - IV	25
3.	Information and Communication Technology Skills - IV	20
4.	Entrepreneurial Skills - IV	25
5.	Green Skills - IV	15
	Total	110

UNIT 1: COMMUNICATION SKILLS - IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Demonstrate active listening skills	1. Active listening -listening skill, stages of active listening 2. Overcoming barriers to active listening	1. Demonstration of the factors affecting active listening 2. Preparing posters of steps for active listening 3. Role-play on negative effects of not listening actively	10
2. Identify the parts of speech	1. Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech	1. Group practice on identifying parts of speech 2. Group practice on constructing sentences	10
3. Write sentences	1. Writing skills to the following: • Simple sentence • Complex sentence • Types of object 2. Types of sentences	1. Group work on writing sentences and paragraphs 2. Practice writing sentences in the active or passive	5

	<ul style="list-style-type: none"> - Active and Passive sentences - Statement/Declarative sentence - Question/Interrogative sentence - Emotion/Reaction or Exclamatory sentence - Order or Imperative sentence <p>3. Paragraph writing</p>	voice 3. Writing different types of sentences	
Total			25

UNIT 2: SELF-MANAGEMENT SKILLS – IV

Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Describe the various factors influencing motivation and positive attitude	<ol style="list-style-type: none"> 1. Motivation and positive attitude 2. Intrinsic and extrinsic motivation 3. Positive attitude – ways to maintain positive attitude 4. Stress and stress management - ways to manage stress 	<ol style="list-style-type: none"> 1. Role-play on avoiding stressful situations 2. Activity on self-reflection 	10
2. Describe how to become result oriented	<ol style="list-style-type: none"> 1. How to become result oriented? 2. Goal setting – examples of result-oriented goals 	<ol style="list-style-type: none"> 1. Pair and share activities on the aim of life 	5
3. Describe the importance of self-awareness and the basic personality traits, types and disorders	<ol style="list-style-type: none"> 1. Steps towards self-awareness 2. Personality and basic personality traits 3. Common personality disorders- <ul style="list-style-type: none"> • Suspicious • Emotional and impulsive • Anxious 4. Steps to overcome personality disorders 	<ol style="list-style-type: none"> 1. Group discussion on self-awareness 	10
Total			25

UNIT 3: INFORMATION AND COMMUNICATION TECHNOLOGY SKILLS - IV

Learning Outcome	Theory (06 hrs)	Practical (14 hrs)	Duration (20 hrs)
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1. Identify the components of a spreadsheet application	1. Introduction to spreadsheet application - types of a spreadsheet, creating a new worksheet, components of a worksheet.	1. Group practice on working with LibreOffice	02
2. Perform basic operations in a spreadsheet	1. Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell 2. Selecting multiple cells 3. Saving the spreadsheet in various formats 4. Closing the spreadsheet 5. Opening the spreadsheet. 6. Printing the spreadsheet.	1. Group practice on working with data on LibreOffice Calc.	03
3. Demonstrate the knowledge of working with data and formatting text	1. Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula 2. Need to format cell and content 3. Changing text style and font size 4. Align text in a cell 5. Highlight text	1. Demonstration of basic calculations in LibreOffice Calc. 2. Group practice on formatting a spreadsheet in LibreOffice Calc.	02
4. Demonstrate the knowledge of using advanced features in spreadsheet	1. Sorting data 2. Filtering data 3. Protecting spreadsheet with password	1. Group practice on sorting data in LibreOffice Calc	03
5. Make use of the software used for making slide presentations	1. Available software presentation 2. Steps to start LibreOffice Impress 3. Adding text to a presentation	1. Group practice on working with LibreOffice Impress tools 2. Group practice on creating a presentation in LibreOffice Impress	02
6. Open, close and save slide presentations	1. Open, Close, Save and Print a slide presentation	1. Practice exercises on steps to save, close, open and save a presentation	01

7. Demonstrate the operations related to slides and texts in the presentation	1. Working with slides and text in a presentation-adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour	1. Group practice on working with font styles and types in LibreOffice Impress	04
8. Demonstrate the use of advanced features in a presentation	1. Advanced features used in a presentation 2. Inserting shapes in the presentation 3. Inserting clipart and images in a presentation 4. Changing slide layout	1. Group practice on working with slides in LibreOffice Impress	03
Total			20

UNIT 4: ENTREPRENEURIAL SKILLS-IV			
Learning Outcome	Theory (10 hrs)	Practical (15 hrs)	Duration (25 hrs)
1. Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	1. Entrepreneurship and entrepreneur 2. Characteristics of entrepreneurship 3. Entrepreneurship-art and science 4. Qualities of a successful entrepreneur 5. Types of entrepreneurs 6. Roles and functions of an entrepreneur 7. What motivates an entrepreneur 8. Identifying opportunities and risk-taking 9. Startups	1. Group discussion on the topic "An entrepreneur is not born but created". 2. Quiz on various aspects of entrepreneurship.	10
2. Identify the barriers to entrepreneurship	1. Barriers to entrepreneurship 2. Environmental barriers 3. No or faulty business plan 4. Personal barriers	1. Fishbowl of fears-group discussion about what we fear about entrepreneurship 2. Facing an Interview.	05
3. Demonstrate the knowledge of entrepreneurial attitude and competencies	1. Entrepreneurial attitude 2. Entrepreneurial competencies 3. Decisiveness, 4. Initiative 5. Interpersonal skills-positive attitude, stress management	1. Group discussion on business ideas 2. Group practice on best out of waste 3. Group discussion on the topic of lets grow together 4. Group practice on a	10

	6. Perseverance 7. Organisational skills- time management, goal setting, efficiency, managing quality.	snowball fight. 5. Activity on rating friends and self for entrepreneurial qualities. 6. Playing games, such as "Who am I".	
Total			25

UNIT 5: GREEN SKILLS-IV

Learning Outcome	Theory (05 hrs)	Practical (10 hrs)	Duration (15 hrs)
1. Identify the benefits of the green jobs	1. Green jobs 2. Benefits of green jobs 3. Green jobs in different sectors: <ul style="list-style-type: none"> • Agriculture • Transportation • Water conservation • Solar and wind energy • Eco-tourism • Building and construction • Solid waste management • Appropriate technology 	1. Group discussion on the importance of green job.	8
2. State the importance of green jobs	1. Importance of green jobs in <ul style="list-style-type: none"> • Limiting greenhouse gas emissions • Minimizing waste and pollution • Protecting and restoring ecosystems • Adapting to the effects of climate change 	1. Preparing posters on green jobs. 2. Activities on tree plantation.	7
Total			15

Part B–Vocational Skills- Grade 12

S. No.	Units	Duration (Hrs)
1.	Unit 1: Extrusion Technology	45
2.	Unit 2: Equipment and Machinery for Soy Processing	40
3.	Unit 3: Maintaining Food Safety and Occupational Health	25
4.	Unit 4: Food Standards	20
5.	Unit 5: Marketing of Soy Products	35
	Total	165

UNIT 1: EXTRUSION TECHNOLOGY			
Learning Outcome	Theory (15)	Practical (30)	Duration (45 Hrs)
1. Explain soy processing industry.	1. Overview of soy processing industry (i) Soy processing (ii) Soy products (iii) Nutritional and health benefits	1. Make an assignment covering following aspects: (i) Significance of soy processing in food processing industry (ii) Health benefits of soybean	7
2. Describe extrusion technology employed in food processing.	1. Introduction to Extrusion Technology 2. Categories of extruded food products (i) Cold extrusion <ul style="list-style-type: none"> • Sev • Chakli • Noodles • Soy sticks • Soy flakes (ii) Extrusion with heat <ul style="list-style-type: none"> • Single screw extrusion • Twin screw extrusion 3. Extrusion process 4. Benefits of extrusion technology	1. Prepare a list of extruded food products available in your surroundings. 2. Make a report on the kind of extruded products available in the market, their category, primary ingredients and shelf-life. 3. Choose one of your favorite extruded products out of the list which you have prepared and discuss in class why it is your favorite.	10
3. Describe the basics of extrusion machinery.	1. Extruders (i) Introduction (ii) Classification (iii) Parts of extruder	1. Visit any food extrusion unit. 2. List types of extruded products being prepared there. 3. Identify and enlist type of extruder being used there. 4. Draw the diagram of extruder along with its important parts.	10
4. Demonstrate the	1. Parameters of Extrusion:	1. Demonstrate	

knowledge on process parameters of extrusion technology.	<p>(i) Independent parameters:(raw material properties, feed rate, barrel temperature, screw configurations, screw speeds, die dimensions)</p> <p>(ii) System parameters (mean residence time, residence time distribution, back pressure and motor torque)</p> <p>2. Effect of extrusion technology on characteristics of food</p>	<p>setting of operating parameters of extruder viz. barrel temperature, pressure, RPM, the flow rate of raw materials, screw speeds in the control panel as per standard procedure.</p> <p>2. Monitor and note down the changes that were occurring in food products pre- and post-extrusion.</p> <p>3. Discuss in class, why specific changes in different characteristics of the extruded product have occurred?</p>	10
5. Describe preparation of Texturized Soy Protein (TSP).	<p>1. Raw material preparation</p> <p>(i) Flour</p> <p>(ii) grits</p> <p>2. Unit operation for cottage level</p> <p>3. Equipment and machinery for TSP</p> <p>4. Packaging and shelf life of TSP</p> <p>5. Utilization of TSP for different products</p> <p>6. Inventory management</p>	<p>1. Visit a industry and make a report on the following parameters:</p> <p>a. Critical parameters for raw material</p> <p>b. Process chart of TSP preparation</p> <p>c. Equipment used in TSP preparation</p> <p>d. Packaging of TSP</p> <p>2. Product preparation using TSP</p>	8
Total			45

UNIT 2: EQUIPMENT AND MACHINERY FOR SOY PROCESSING

Learning Outcome	Theory (15)	Practical (25)	Duration (40 Hrs)
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1. Identify machinery used for primary processing of soybeans.	1. Equipment used in primary processing of Soybean (i) Weighing Balance (ii) Cleaners (iii) Graders (iv) De-hullers (v) Storage facility	1. Calculate the percentage of healthy grain, broken grain, foreign material and diseased grain from a market sample.	11
2. Identify machinery used for secondary processing of soybeans.	1. Equipment used in secondary processing of Soybean (i) Blancher (ii) Dryer (iii) Grinder (iv) Soy milk plant (v) Filtration Unit (vi) Tofu Pressing Machine (vii) Packaging machines	1. Calculate mass balance of soy milk and tofu.	14
2. Identify machinery used for tertiary processing of soybeans	1. Equipment used in tertiary processing of Soybean (i) Dry Blender (ii) Dough making machine (iii) Oven (iv) Extruder (v) Dryer (vi) Packaging Machine	1. Survey the market to identify the Ready to Eat (RTE) products. 2. Compare the percentage of soy in market surveyed soy products. 3. Prepare soy fortified cookies and collect feedback from the students about the acceptability.	15
Total			40

UNIT 3: MAINTAINING FOOD SAFETY AND OCCUPATIONAL HEALTH

Learning Outcome	Theory (10)	Practical (15)	Duration (25 Hrs)
1. Describe the food spoilage, causes of food spoilage and changes in food quality due to food spoilage.	1. Food Spoilage 2. Causes of food spoilage (i) Microbial (ii) Enzymatic (iii) Chemical (iv) Physical factors <ul style="list-style-type: none"> • Appearance • Smell • Texture 	1. Store tofu, paneer, soy milk and dairy milk at room temperature and in refrigerator for five days. 2. Observe changes occurring in these products and report your findings.	7

	<ul style="list-style-type: none"> • Flavour 3. Changes in food quality due to spoilage	3. Discuss out of these three products, which one spoiled faster and why?	
2. Explain factors affecting food spoilage.	1. Factors affecting food spoilage <ol style="list-style-type: none"> (i) Moisture content (ii) Temperature (iii) Oxygen (iv) Acidity (v) Nutrient composition of raw material and finished product (vi) Storage conditions 	1. Store few perishable food items for few days at different freezing, chilling and room temperature and note down the changes occurring.	7
3. Describe the food preservation, principles.	1. Food preservations 2. Principles of food preservation 3. Techniques of food preservation <ol style="list-style-type: none"> (i) Traditional techniques (ii) Modern techniques 	1. Perform preservation techniques of salting, pickling, blanching, freezing, chilling, acidification etc. in class.	7
1. Explain safety practices and demonstrate use of PPE	1. Potential safety hazards at work place 2. Safety measures to prevent accidents at workplace 3. Safety signs and symbols 4. Importance of using protective equipment and clothing 5. Precaution in handling heavy equipment	1. Perform the steps to be followed during emergency and evacuation procedure. 2. Demonstrate the procedure of freeing a person from electrocution. 2. Show how to administer appropriate first aid in case of minor cuts, bleeding, burns, choking, electric shock, etc.	4
Total			25

UNIT 4: FOOD STANDARDS

Learning Outcome	Theory (8)	Practical (12)	Total (20 hrs)
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1. Describe the soy food standards.	<ol style="list-style-type: none"> 1. Soy Food Standards <ol style="list-style-type: none"> (i) Food and Safety Standards Authority of India (FSSAI) (ii) Hazard Analysis Critical Control point (HACCP) 2. Agencies involved in setting up and monitoring food standards <ol style="list-style-type: none"> (i) Bureau of Indian Standards (BIS) (ii) International Standardization Organization (ISO) 	<ol style="list-style-type: none"> 1. Study soy food standards from the BIS website for following soy products: <ol style="list-style-type: none"> a. Soy flour b. Soy milk c. Tofu d. TSP 2. From the standards identify the mandatory parameters for above products. 	25
Total			20

UNIT 5: MARKETING OF SOY PRODUCTS

Learning Outcome	Theory (15)	Practical (20)	Duration (35)
1. Describe the marketing of Soy Products.	<ol style="list-style-type: none"> 1. Concept of Marketing 2. Difference between Marketing and Sales 3. Branding 4. Marketing strategies <ol style="list-style-type: none"> (i) Packaging (ii) Shelf life (iii) Social and print media 	<ol style="list-style-type: none"> 1. Make an imaginary product profile and sell it in your school 2. While the students go for OJT in industries, select a product and promote it on social media and submit a report 	18
2. Describe the importance of entrepreneurship incubation centers and start-ups.	<ol style="list-style-type: none"> 1. Incubation Centre 2. Start-ups 3. Feasibility analysis of the project 4. Preparation of Project Profile 5. Registration and Licensing 6. Funding Agencies involved in promoting entrepreneurship and start-ups <ol style="list-style-type: none"> (i) Micro, Small & Medium Enterprises (MSME) (ii) Ministry of Food Processing Industries (MoFPI) (iii) National Bank for Agriculture and Rural 	<ol style="list-style-type: none"> 1. Identify the industries preferably in soy products your district 2. Prepare a project profile of the industry in the district 3. Visit an incubation Centre. 	17

	Development (NABARD) (iv) National Rural Livelihood Mission (NRLM) (v) Khadi and Village Industries Commission (KVIC) (vi) Banks		
			Total
			35

6. ORGANISATION OF FIELD VISITS

In a year, at least 4 visits to a nearby food processing, preferably Soy processing unit/ Food extrusion unit should be organised for the students to expose them to the various routine activities undertaken at a soybean processing unit/ industry.

Visits to a nearby Soybean processing industry/unit should facilitate the students to observe for themselves the following:

Location, product preparation area, raw material collection and storage area, weighing room, storage chamber, production area, packing chamber, finished products storage area, supply counter or room, cleaning and maintenance area, waste disposal area, etc. During the visit, students observe and obtain the following information from the owner or the supervisor of the processing unit/industry:

1. Approaches to manage a Soy processing unit.
2. Identification of different categories of extruded products.
3. Identification of various types of soybean processing equipment, machinery, tools and utensils used in industry.
4. Process of producing soy products including soy flour, soy milk, tofu and texturized soy protein etc.
5. Optimization of available resources at the soybean processing unit.
6. Maintenance procedure of the production machines and their component.
7. Procedures followed for preparing the raw material to be used for production.
8. Steps performed for preparing the extruder for soy protein production.
9. Standard practices to be followed for food production.
10. Understand roles and responsibilities of a Soy Products Processor.
11. Ways to ensure and implement food safety and personal hygiene at the workplace.
12. Types of packaging material used
13. Types of products prepared
14. Total input and output handled annually
15. Manpower engaged
16. Total annual income
17. Profit/Loss (Annual)
18. Any other information

7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the schools so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

S. No.	Particulars/ Equipment	Quantity	Approximate cost (Rupees)
1.	Soy milk plant	1	400000/-
2.	Automatic bottle sealing unit	1	250000/-
3.	Vacuum packaging machine	1	100000/-
4.	Chiller	1	30000/-
5.	Milling machine	1	50000/-
6.	Oven	1	25000/-
7.	Refrigerator	1	25000/-
8.	Cleaner, grader	1	25000/-
9.	De-huller	1	20000/-
10.	Blanching Unit	1	18000/-
11.	Autoclave	1	10000/-
12.	Pneumatic press	1	7000/-
13.	Weighing balance	1	5000/-
14.	Mixer Grinder	1	5000/-
15.	Soy milk bottle sealing machine manual	1	2000/-
16.	Tofu hand press	1	2500/-
17.	Sealing machine	1	2000/-
18.	Miscellaneous	-	20000/-
	Total		9,96,500/-

8. VOCATIONAL TEACHER'S/ TRAINER'S QUALIFICATION AND GUIDELINES

Qualification and other requirements for appointment of vocational teachers/trainer on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

S. No.	Qualification	Minimum Competencies	Age Limit
1.	Post-graduation in food processing/ food technology/ food science/ nutrition/ degree in allied subjects in the relevant area or field from a recognized Institute/University, with at least 1 year work experience	<ul style="list-style-type: none"> Effective communication skills (oral and written) Basic computing Skills 	22- 37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

9. LIST OF CONTRIBUTORS

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10. LIST of REVIEWERS

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