

Syllabus for Rice Milling Technician

Course Name	Rice Milling Technician
Sector	Agriculture
Course Code	AGR/2024/RMTE/375
Level	4
Occupation	Rice Milling Technician
Job Description	The technician is responsible to operate various rice processing facilities. Responsible for maintenance and operation of milling equipment/milling machineries available in different sections of rice processing industry . Also he will assess the quality of paddy/rice and virous by products
Course Duration	Total Duration 420 Hrs (T-90, P-210, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 12 – Regular OR Vocational OR 10th grade pass plus 2-year NTC/NAC OR Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma OR 10th grade pass and pursuing continuous schooling OR 10th grade pass with 2 years experience OR Previous relevant Qualification of NSQF Level 3.0 with minimum education as 8th Grade pass with 3 year relevant experience OR Previous relevant qualification of NSQF Level 3.5 with 1.5 year relevant experience
Trainers Qualification	B.E./B. Tech in Food science and Technology with 1 year experience in the relevant field OR Diploma in Milling Technology with 2 year experience in the relevant field OR NAC/NTC in Mechanical trade with 5 years experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Compulsory/ Elective	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs) [Multiple of 30]
1	Rice processing and rice milling	Describe rice processing and rice milling techniques	Compulsory	20	40		60
2	Rice mill and rice processing machinery	Demonstrate the operation of rice processing machinery	Compulsory	20	70		90
3	Packaging and storage of rice	Explain the requirement of packaging and storage of rice	Compulsory	20	40		60
4	Production of value added products	Demonstrate the preparation of value added product and by product of rice	Compulsory	20	40		60
5	Maintenance and safety measures	Illustrate maintenance procedure along with safety measures	Compulsory	10	20		30
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	-	-	60	60
7	Employability Skill	As per guided curriculum	Compulsory	60	-		60
TOTAL				150	210	60	420

SYLLABUS:**Module No. 1: Rice processing and rice milling****Outcome:** Describe rice processing and rice milling techniques**Theory Content:**

- Rice Processing - importance of process Paddy
- History of rice processing
- Different types of rice available in world and Indian market
- Requirement of space for different capacity of mills.
- Importance of knowledge on rice milling techniques
- Traditional methods of rice processing and modern concepts of rice processing

Practical Content:

- Different types of rice in Indian market.

- Visualization of different ricesamples produced in the market and discussion.
- Traditional method of rice processing.
- Conventional methods of riceprocessing Single steam parboiling
- Double steam parboiling
- Modern methods of rice processing
- Hot soaking - Improved hotsoaking method

Module No. 2: Rice mill and rice processing machinery

Outcome: Demonstrate the operation of rice processing machinery

Theory Content:

- Traditional rice processing machinery
- Huller machines
- Modified huller machines
- Semi modern rice mill and machinery
- ModernRice Mills and Ricemachinery
- Pre-cleaners - Destoners - Differenttype of Huller / Sheller machines
- Different Paddy Separators Different Polishers
- Brokenseparator - Silky polisher – Destoner
- Colour sorters - Bagging unit
- Parboiling vessels and machinery used in parboiling section
- Boiler -Parboiling vessel – Dryer - Drying method

Practical Content:

- Traditional method of rice processing using Huller machine Milling of raw paddy in semimodern rice mill Milling of parboiled paddy in semi modernrice mill.
- Laboratory milling study Calculation of milling yield Milling of raw paddy in modernrice mill
- Milling of parboiled paddy inmodern rice mill
- Parboiling of paddy at mill levelMild parboiled rice
- Assessment of drying time and drying at mill yard. Assessment of drying time and drying in dryer

Module No. 3: Packaging and storage of rice

Outcome: Explain the requirement of packaging and storage of rice

Theory Content:

- Evaluate the comprehension of methods used in the assessment of paddy and rice quality.
- Storage and packaging of Paddy/Rice, Prevention of high moisture paddy
- Packaging methods and their impact on maintaining rice quality.

Practical Content:

- Assessment of physical parameters,
- Assessment of paddy for FAQ standard,

- Assessment of rice for FAQ standard, Assessment of Rice cooking quality
- Assessment of Rice cooking quality
- Storage of paddy/Rice
- Prevention of high moisture paddy Gelatinization properties

Module No. 4: Production of value added products

Outcome: Demonstrate the preparation of value added product and by product of rice

Theory Content:

- Potential traditional processing techniques and By-product utilization
- Value added products from rice
- Traditional foods, extruded products, health drinks, convenient food products

Practical Content:

- Preparation of ethnic food products, puffing, flaking, parching and roasting.
- By product utilization.
- Estimation of moisture and oil content in rice bran
- Preparation ready to eat and ready to cook extruder products and drinks, bakery products

Module No. 5: Maintenance and safety measures

Outcome: Illustrate maintenance procedure along with safety measures

Theory Content:

- Maintenance of Rice Milling Machines and Safety measures.
- Identification of risks involved.
- Use of fire control system
- Storing chemicals at proper place.
- Sanitation of processing plants.
- Basic Servicing and maintenance of various equipment, machines involved in processing.
- Updating of maintenance registers.
- Explain the requirements of personal health, hygiene and fitness at work.
- Explain the importance of goodhousekeeping at the workplace

Practical Content:

- Problem shooting areas in rice mill,
- Identification of risks involved.
- Use of fire control system.
- Storing chemicals at proper place.
- Sanitation of processing plants.
- Use of emergency switches.
- Safety measures and visit to industries
- Demonstrate personal hygiene practices to be followed at the workplace.
- Demonstrate adherence to the workplace sanitization norms.
- Show how to ensure cleanliness of the work area.

Module 6: OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours.**)

Module 7: Employability Skills (60 Hrs)

Key Learning Outcomes

Introduction to Employability Skills

Duration: 1.5

Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship

Duration: 1.5

Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century

Duration: 2.5

Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills

Duration: 10

Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting

Duration: 2

Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills

Duration:

5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion

Duration: 2.5

Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy

Duration:5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills

Duration: 10

Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship

Duration:

7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service

Duration:

5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs
8 Hours

Duration:

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Describe rice processing and rice milling techniques	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1 Explain the significance of processing paddy in the rice production chain. 1.2 Identify various types of rice available globally and in the Indian market. 1.3 Explain how milling techniques impact the final product 1.4 Demonstrate single steam parboiling and double steam parboiling techniques. 1.5 Demonstrate modern rice processing techniques. 1.6 Analyze the advantages and disadvantages of each processing method. 1.7 Explain rice milling techniques in terms of quality, efficiency, and yield.
2	Demonstrate the operation of rice processing machinery	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1 Describe traditional rice processing machinery. 2.2 Comprehend modified huller machines and their improvements over traditional models. 2.3 Illustrate modern rice mills and the various machinery used in these mills. 2.4 Identify different processing equipment viz. paddy separators, polishers, broken separators, silky polishers, destoners, and color sorters. 2.5 identify parboiling vessels and machinery used in the parboiling section. 2.6 Perform drying assessment using a dryer 2.7 Complete documentation for each practical activity

Module No.	Outcome	Assessment Criteria
3	Explain the requirement of packaging and storage of rice	<p>After completion of this module students will be able to:</p> <p>3.1 Explain the importance of quality assessment in the rice industry.</p> <p>3.2 Demonstrate proper storage techniques for paddy and rice.</p> <p>3.3 Measure and interpret physical attributes such as size, shape, color, and moisture content.</p> <p>3.4 Evaluate paddy for adherence to FAQ (Fair Average Quality) standards.</p> <p>3.5 Assess the cooking quality of rice.</p> <p>3.6 Implement proper storage practices for both paddy and rice.</p> <p>3.7 Recognize the impact of gelatinization on the cooking quality of rice.</p> <p>3.8 Complete documentation for each practical activity</p>
4	Demonstrate the preparation of value added product and by product of rice	<p>After completion of this module students will be able to:</p> <p>4.1 Explain potential traditional processing techniques for rice</p> <p>4.2 Identify and describe by-products generated in rice processing</p> <p>4.3 Describe the value-added products derived from rice.</p> <p>4.4 Prepare of ethnic food products using traditional processing techniques.</p> <p>4.5 Demonstrate the puffing, flaking, parching, and roasting techniques.</p> <p>4.6 Explain the utilization of by-products generated during rice processing.</p> <p>4.7 Prepare ready-to-eat and ready-to-cook products using extrusion techniques.</p> <p>4.8 Prepare bakery products using rice-based ingredients.</p>
5	Illustrate maintenance procedure along with safety measures	<p>After completion of this module students will be able to:</p> <p>5.1 Describe fundamental principles to the maintenance of rice milling machines</p> <p>5.2 Explain preventive measures and responses to fire emergencies.</p> <p>5.3 Explain the correct storage practices for chemicals used</p> <p>5.4 Demonstrate basic servicing and maintenance tasks for rice milling equipment and machines,</p> <p>5.5 Describe basic servicing and maintenance of various equipment and machines used in rice processing.</p> <p>5.6 Explain the importance of good housekeeping at the workplace.</p>

Module No.	Outcome	Assessment Criteria
		5.7 Identify and resolve common issues in rice milling machines 5.8 Apply safety measures during emergency scenarios.
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).
7	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

S.No.	Description of Tools	Quantity
1.	Hand winnower – Plastic	4
2.	Cloth (For cloth bags)	4 meters
3.	Nylon bags	4 meters
4.	Trays	4
5.	Spoons	8
6.	Lab chappals	16
7.	Mini - Lab Sheller	2
8.	Mini - Lab polisher	2
9.	Lab broken separator	1
10.	Lens	2
11.	Crack detector	1
06.	L,B measurement wooden board	4
13.	Dial caliper	2
14.	Paddy – Soaking vessels – Plastic	4
15.	Parboiling coffee filter like vessels (upto 2Kg cap.) with lid (SS)	2
16.	Vessel – for saturation test –(SS)	2
17.	Cooking vessels – for gruel loss (dia.~ 1feet, with provision for placing six 250 ml. beakers simultaneously) (SS).	2
18.	Rice cooking vessel (Suitable to place a stand of 15 test tubes simultaneously) (SS).	2
19.	Vessel for elongation test (SS) (Boiling and cooling)	2 + 2
20.	Fabrication of wire meshes (Gruel loss test and Elongation test)	24 Nos.
21.	Fabrication of stands to hold wire meshes (Gruel loss test and Elongation test)	4
22.	Wire gauge – to hold samples, and sample holding containers (SS)	20
23.	Hawkins pressure cooker 1 Lit.	1 No.
25.	Hawkins pressure cooker 2 Lit.	1 No.
26.	Stainless steel plates	2 nos
27.	Moisture box	25 nos.
28.	Heat sealing machine	1
29.	Single burner stove	2
30.	Induction stove	1
31.	Instructor chair and table	1
32.	Dual desk	10
33.	Work table for grain testing and quality tests	2
34.	Stools	16
35.	Discussion table	1
36.	Tool cabinet	1
37.	Trainees locker with space for 16 members	1
38.	First aid box	1

S.No.	Description of Tools	Quantity
39.	Book shelf	1
20.	Storage rack – mesh cupboard	1

S.No.	Description of Equipment	Quantity
1.	Weighing balance (Cap. 200g and 5 Kg) – each two	2+2
2.	Moisture meter	4
3.	Oven	1
4.	Lab Sheller	1
5.	Lab polisher	1
6.	Oil extractor	1
7.	Sand bath	2
8.	Vortex mixer	2
9.	Digital Temperature probes - 1meter, 30 cm, 60 cm length	Each 2
10.	Sieve sets	1 set
11.	Hot water bath with temperature control	2
06.	Cold water bath.	1

S.No.	Description of Glassware and Chemicals	Quantity
1.	Flat bottom oil flasks	18
2.	Oil Extraction set (condenser and extractor)	1set each
3.	Thimbles	18
4.	Standard flask 1 Lit	4
5.	Standard flask 500 ml	4
6.	Standard flask 250 ml	4
7.	Standard flask 100 ml	20
8.	Standard flask 50 ml	10
9.	Beaker 1000 ml	4
10.	Beaker 500 ml	4
11.	Beaker 250 ml	20
06.	Beaker 100 ml	20
13.	Cooking Test tubes (50ml – graduated for each ml) (flat bottom)	25
14.	Boiling tubes – round bottom (50 ml)	25
15.	Test tubes 25 ml (round bottom without rim)	25
16.	Conical Flask (100 ml)	25
17.	Measuring jar 10ml, 25ml, 50ml,100ml – each 10	4x10
18.	Measuring jar 250ml, 500ml, 1000lit – each 2	3x2
19.	Funnel Ø 2.5 cm; Funnel Ø 7.5 cm	Each 20
20.	Conical Flask (250 ml)	10
21.	Petri Plates – Inner 9.5 cm	25
22.	Petri Plates - Inner 13 cm	10
23.	What man no 1 Filter paper	6 boxes
24.	Desiccators	2
25.	Burette: 25ml	4
26.	Crucible	10
27.	Wash bottles	4
28.	Bunsen burners	4
29.	Gas stove (Single burner)	2
30.	Induction stove	1
	List of Chemicals	
1.	Sodium Hydroxide	
2.	Sodium Chloride	
3.	Potassium hydroxide	
4.	Xanthene	
5.	HCL, H ₂ SO ₄ ,and other chemicals as per need.	

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Describe rice processing and rice milling techniques	AGR/0275/OC1	30	130	0
Demonstrate the operation of rice processing machinery	AGR/0275/OC2	30	160	0
Explain the requirement of packaging and storage of rice	AGR/0275/OC3	30	130	0
Demonstrate the preparation of value added product and by product of rice	AGR/0275/OC4	30	130	0
Illustrate maintenance procedure along with safety measures	AGR/0275/OC5	30	100	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	AGR/0274/OC6	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0