Syllabus for Self-Propelled Rice Transplanting Machine Operator

Course Name	Self-Propelled Rice Transplanting Machine Operator
Sector	Agriculture
Course Code	AGR/2024/SRMO/364
Level	3
Occupation	Self-Propelled Rice Transplanting Machine Operator
Job Description	After completion of this training the participant will be able to operate rice transplanter, preparation of seed bed and maintenance and repair of the machine.
Course Duration	**Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)**
Trainees' Entry Qualification	Grade 10 OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR 5th grade pass with 5 years relevant experience 0R Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	B. Tech in Agricultural Engineering, 1 year experience in the relevant field OR Diploma in Agriculture Engg, 2 years' experience in the relevant field OR B E/ B. Tech in Mechanical Engineering, 1 year experience in the relevant field OR Diploma in Mechanical Engg, 2 years' experience in the relevant field OR NAC/NTC in agriculture related trade with 3 years' experience in the field. Desirable qualification: Working experience in Farm Machinery Operating

Structure of Course:

Module No.	Module name	Outcome	Compulsory/ Elective	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs)
1	**Introduction to Rice Transplanter**	Describe Operational Driving and Control Procedures for Rice Transplanter	Compulsory	10	20		30
2	**Management of nursery**	Demonstrate nursery raising and field preparation techniques for mechanical transplanter	Compulsory	20	40		60
3	**Nutrient management of nursery**	Organize seedling mats, Soil and Water Management, Weed and Fertilizer Practices for Transplanting	Compulsory	20	40		60
4	**Function of self-propelled rice transplanter**	Explain the function of Self-Propelled Rice Transplanter: Components, Functions, Operation, and Maintenance	Compulsory	10	20		30
5	**Field preparation**	Demonstrate field preparation technique for rice transplanter	Compulsory	10	20		30
6	**Precision plant control**	Exhibit precision planting control and mechanism in agricultural transplanting	Compulsory	10	20		30
7	**Machine operation and maintenance**	Check the machine operation and maintenance of rice transplanter	Compulsory	10	20		30
8	**OJT**	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	--	--	60	60
9	**Employability Skill**	As per guided curriculum	Compulsory	60	--	--	60
		TOTAL		**150**	**180**	**60**	**390**

SYLLABUS:

Module No. 1: Introduction to Rice Transplanter

Outcome: Describe Operational Driving and Control Procedures for Rice Transplanter

Theory Content:

- Qualities of good rice transplanter, operator, including patience, responsibility, self-confidence and concentration
- Technical terminology of rice Transplanter
- Procedure of use of various control in rice Transplanter , U turning , loading, unloading, Straight planting, row spacing
- Controlling and adjusting the planting depth of the rice transplanter
- Adjust the control for the number of plants per hill
- Procedure for adjust and maintain Hill-to-hill distance control

Practical Content:

- Different types of rice transplanters, including self-propelled, manual and mechanical variants
- Various components of a rice transplanter and their functions.
- Demonstrate the qualities of a good rice transplanter operator.
- Technical terminology during the operation of the rice transplanter.
- Various controls during the operation of the rice transplanter.
- Demonstrate the procedure of steering the rice transplanter.

Module No. 2: Management of nursery

Outcome: Demonstrate nursery raising and field preparation techniques for mechanical transplanter

Theory Content:

- Criteria for selecting appropriate seeds for mechanical transplanter use
- Managing nursery for mechanical transplanter preparation.
- Growing a nursery in wet field conditions
- Nursery raising and field preparation techniques formechanical TRANSPLANTER
- Selection of seed, nursery management, preparation of soil
- Calibration of metering mechanism, Primary secondary and puddling implements.

Practical Content:

- Criteria of Selection of seeds and frames for different types of rice transplanters
- Management of nursery, growing of nursery in wet field condition.
- Preparation of nursery bed with correct ratio of soil and sand
- Calculation of seed requirement for mechanical rice transplanter
- Operate Primary tillage implement and puddling implement
- Achieve desire puddling quality for mechanical rice transplanter and calculating the puddling index

- Prepare Puddled fields and allowing soil to settle for 12- 24 hours
- Apply light irrigation and draining excess water in preparation for transplanter operation

Module No. 3: Nutrient management of nursery

Outcome: Organize seedling mats, Soil and Water Management, Weed and Fertilizer Practices for Transplanting

Theory Content:

- Nutrient management of nursery
- Selection of seedling trays
- Quality seedling mix
- Proper spacing, temperature and humidity control
- Soil and water management
- Weed and fertilizer practices for transplanting
- Fertilizer management

Practical Content:

- Use of Seedling mats for maintaining an optimal and consistent temperature for germination and early growth.
- Examine the soil nutrient level through testing
- Monitor water application to avoid overwatering or underwatering contributing to the overall health of seedlings
- Find the choice between Puddled and non-puddled seedling trays
- Examine the Field condition,
- Evaluate the timing and method of adding permanent water 4-5 days after Transplantering, Weed management, Fertilizer management
- Assess the efficiency of water drainage in both types of trays
- Pre-emergence, One hand weeding, DAP - 50 kg/acre, MOP - 20-25 kg/acre, First dose, Second dose, Third dose, Pest management

Module No. 4: Function of self-propelled rice transplanter

Outcome: Explain the function of Self-Propelled Rice Transplanter: Components, Functions, Operation, and Maintenance

Theory Content:

Parts and Components of self propelled rice TRANSPLANTER, function, uses operation and maintenance, cooling, hydraulic system, Transplantering mechanism

Practical Content:

- Identify various parts and components of a self-propelled rice

transplanter

- Engine, Engine rack ,Power transmission system, Gear box , Scroll shaft mechanism
- Diesel Engine operated rice TRANSPLANTER, care and maintenance
- Identify different components of diesel engine
- Maintenance of air filter, Lubrication system
- Cooling system, function and maintenance
- Identify and explain the functions of components of paddy transplanter
- Function of hydraulic system in the context of a rice tranplanter
- Explain the function of the transplanter mechanism
- Inspect and maintain components of Tail wheel, Floating board, Hanger chain, Chain case, Tray to store mats
- Operate and adjust components of Transport wheel ,Seedling platform, Transplantering arm, Speed change handle, clutch handle, Seedling processing handle

Module No. 5: Field preparation

Outcome: Demonstrate field preparation technique for rice transplanter

Theory Content:

- Metering Mechanism of rice TRANSPLANTER,
- Engaging and dis engaging of Transplantering equipment . Importance of correct engagement and disengagement during various stages of operation.
- Field preparation for rice Transplantering,
- Operating procedure of for field preparation rotavator
- Effectively Nursery management practices

Practical Content:

- Inspect, adjust and maintain Metering mechanism of TRANSPLANTER
- Troubleshoot common issues related to the metering mechanism
- Identify, inspect and maintain components related to Power transfer mechanism
- Demonstrate the operating procedure of planting clutch, running clutch.
- Set and adjust the ploughing depth for mechanical Transplanting
- Operate and maintain Puddling implements
- Calculation Soil strength/ puddling quality.
- Handling of polythene sheets watering cane irrigation for the first 3-4 days
- Identify and address the treatment of nutrient deficiencies in the nursery stage

- Nursery density and its impact on seedling growth
- Determine and maintain the optimal density for a specific crop./

Module No. 6: Precision plant control

Outcome: Exhibit precision planting control and mechanism in agricultural transplanting

Theory Content:

- Planting depth control in rice transplanter
- Number of plants per hillcontrols
- Hill-to-hill distance control
- Purpose and functioning of a Straight planting marker
- Function of Planting clutch, Main clutch
- Accelerator system in a rice transplanter
- Role and function of the Floating board.
- Gear mechanism controlling plant-to-plant distance

Practical Content:

- Use and adjust the straight planting marker
- Setting and adjusting Hill-to-hill distance control
- Engage and disengage the planting clutch, main clutch and accelerator
- Adjust and utlize the floating board
- Adapt to varying field conditions for optimal planting
- Select and control gear mechanism for plant to plant distance

Module No. 7: Machine operation and maintenance

Outcome: Check the machine operation and maintenance of rice tansplanter

Theory Content:

- Checks for machine operation and maintenance
- The role of **e**ngine oil in the proper functioning of the transplanter
- Significance of Air filter in preventing contaminants from entering the engine
- Role of gear oil
- The importance of gearbox oil in the planting mechanism
- Use and maintenance of oil for the transplanting fingers
- Miscellaneous mechanical check
- Function and maintenance requirements of finger push rods
- The signs of wear of transplanting fingers and the importance of proper alignment
- Checking and tightening loose nuts and bolts
- Maintenance requirement of the machines platform

Practical Content:

- Conduct check and maintenance for engine oil, air filter, gear oil, planting gearbox oil and transplanting finger oil.

- Conduct miscellaneous mechanical check inspecting finger push rods, checking finger wear and alignment and tightening loose nuts and bolts
- Identify and troubleshoot the issues during hands-on inspections

Module 8: 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 9: 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

Duration: 8 Hours

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 Operational Driving and Control Procedures for Rice Transplanter	**After completion of this module students will be able to:** 1.1 Describe the qualities of good operator 1.2 Explain key technical terms associated with the machinery 1.3 Identify different types of self propelled rice transplanters, manual rice transplanters and mechanical rice transplanters 1.4 Recognize the component of a rice transplanter and their respective functions 1.5 Demonstrate the procedures for various controls in rice transplanter operation.
2	Demonstrate nursery raising and field preparation techniques for mechanical transplanter	**After completion of this module students will be able to:** 2.1 identify and select appropriate seed varieties for mechanical rice transplanting 2.2 Explain the procedure of nursery management 2.3 Prepare the nursery bed with the correct ratio of soil and sand 2.4 Calculate seed requirement for mechanical rice transplanters 2.5 Demonstrate the operation and adjustment of primary tillage implements 2.6 Demonstrate the correct application of light

Module No.	Outcome	Assessment Criteria
		irrigation after puddling
3	Organize seedling mats, Soil and Water Management, Weed and Fertilizer Practices for Transplanting	**After completion of this module students will be able to:** 3.1 Describe the nutrient requirements for seedling growth in the nursery 3.2 Choose appropriate seedling trays based on the type of crop and transplanting method 3.3 Demonstrate the technique for maintaining optimal spacing, temperature and humidity in the nursery 3.4 Explain the importance of soil quality in seedling development 3.5 Apply the fertilizers according to the recommended doses 3.6 Identify common pests affects seedlings
4	Explain the function of Self-Propelled Rice Transplanter: Components, Functions, Operation, and Maintenance	**After completion of this module students will be able to:** 4.1 Demonstrate various parts and components of a self propelled rice transplanter 4.2 Explain the functions and uses of a self propelled rice transplanter 4.3 Demonstrate the colling system in the engine 4.4 Describe hydraulic system, its components and the functions in the transplanter 4.5 Explain the operation and significance of transplantering mechanism 4.6 Identify the components of a diesel engine 4.7Demonstrate maintenance procedures for the air filter, lubrication system and cooling system. 4.8 Identify different components in a paddy transplanter 4.9 Assemble and disassemble of tail wheel, floating board, hanger chain, chain case and tray for mat storage 4.10 Maintain the safety protocol during the operation and maintenance of the transplanter
5	Demonstrate field preparation technique for rice transplanter	**After completion of this module students will be able to:** 5.1 Describe the metering mechanism in rice transplanter 5.2 Explain the process for engaging and disengaging transplantering equipment 5.3 Exhibit the role of field preparation in successful rice transplantering 5.4 Engage and disengage the planting clutch 5.5 Apply technique to adjust the ploughing depth for optimal transplantering

Module No.	Outcome	Assessment Criteria
		5.6 Demonstrate different puddling implements 5.7 Explain the use of polythene sheets during transplantering 5.8 Identify and address nutrient deficiencies in the nursery 5.9 Calculate nursery density on seedling health
6	Exhibit precision planting control and mechanism in agricultural transplanting	**After completion of this module students will be able to:** 6.1 Explain the concept of planting depth in rice transplantering 6.2 Describe the procedure to control the number of plants per hill during transplntering 6.3 Demonstrate hill-to-hill distance control mechanisms 6.4 Explain the purpose and operation of a straight planting marker 6.5 Explain the function of the planting clutch 6.6 Demonstrate the control transplatering speed using the accelerator 6.7 Select the adjust the gear mechanism for plant-to-plant distance control 6.8
7	Check the machine operation and maintenance of rice transplanter	**After completion of this module students will be able to:** 7.1 Describe the importance of regular checks for machine operation and maintenance 7.2 Explain the role of engine oil in machine operation 7.3 Exhibit the significance of air filter in maintaining engine performance 7.4 Perform difference checks viz. gear oil, gearbox oil, finger oil to maintain engine performance 7.5 Demonstrate tightening of loose nuts and bolts
8	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).
9	As per guided curriculum	As per guided curriculum

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

Sl. No	Description	Quantity
1.	Rice TRANSPLANTER , 8 rows, 5 hp, riding type	01 no
2.	Transplanting frame 1mx1m, 10 sections	10 nos.
3.	Mechanical nursery growing set up, 50frames/h, 2 hp single phase electric motor	01 no
4.	Farm Yard Manure	1 Trolley
5.	Soil	As required
6.	Sand	
7.	Paddy Seeds	
8.	Sieves	
9.	Diesel	

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Describe Operational Driving and Control Procedures for Rice Transplanter	AGR/0276/OC1	20	80	0
Demonstrate nursery raising and field preparation techniques for mechanical transplanter	AGR/0276/OC2	20	120	0
Organize seedling mats, Soil and Water Management, Weed and Fertilizer Practices for Transplanting	AGR/0276/OC3	20	130	0
Explain the function of Self-Propelled Rice Transplanter: Components, Functions, Operation, and Maintenance	AGR/0276/OC4	30	80	0
Demonstrate field preparation technique for rice transplanter	AGR/0276/OC5	20	80	0
Exhibit precision planting control and mechanism in agricultural transplanting	AGR/0276/OC6	20	80	0
Check the machine operation and maintenance of rice transplanter	AGR/0276/OC7	20	80	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	AGR/0276/OC8	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0