

Syllabus For Medicinal and Aromatic Plant Cultivator

Course Name	Medicinal and Aromatic Plant Cultivator
Sector	AGRICULTURE
Course Code	AGR/2024/MAPC/368
Level	4
Occupation	Medicinal and Aromatic Plant Cultivator
Job Description	Medicinal and Aromatic Plant Cultivator will be responsible for the cultivation, management, post-harvesting practices, and value addition techniques of various medicinal and aromatic plants. His/her role involves overseeing the entire process from planting to harvesting, ensuring optimal growth conditions, and implementing sustainable farming practices.
Course Duration	Total Duration 480 Hrs (T-120, P-240, 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	NTC/NAC in the trade of floriculture and Landscaping with 7 yrs experience in relevant field OR Diploma in Agriculture/ Horticulture with 5 yrs experience in relevant field OR Graduate in Agriculture/ Horticulture/ Botany/ Forestry with 2 yrs experience in relevant field OR Post- Graduate in Medicinal Plant/ Agriculture/ Horticulture/ Botany/ Forestry with 1 yrs experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
1	Familiarization	Identify, classify and list out the importance of Medicinal and Aromatic Plants.	40	50	90
2	Cultivation and Management	Demonstrate the procedure of cultivation for growing Medicinal and Aromatic Plants.	30	90	120
3	Post harvesting Practices	Execute Post harvesting Practices for Medicinal and Aromatic Plants.	20	40	60
4	Value Addition Techniques	Prepare different value-added products using various medicinal and aromatic plants.	30	60	90
5.	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	--	60	60
6.	Employability Skill	As per guided curriculum.	60	--	60
TOTAL:			180	300	480

SYLLABUS:**Module No. 1: Familiarization**

Outcome: Identify, classify and list out the importance of Medicinal and Aromatic Plants.

Theory Content:

- 1.1. Importance and present scenario of cultivation Medicinal & aromatic crops cultivation.
- 1.2. Use of various medicinal and aromatic plants.
- 1.3. Classification of different medicinal and aromatic plants on the basis of nature of plant / life span / family/ growing season / parts used.
- 1.4. Importance of conservation of biodiversity of medicinal and aromatic plants
- 1.5. List of common medicinal plants, parts used, utility.
 - i) *Gymnema sylvestre* (Gurmar) Parts used: Leaf and twig
 - ii) *Asparagus racemosus* (Shatavar) Parts used: Tuberos roots
 - iii) *Tinospora cordifolia* (Gulancho) Parts used: only Stem
 - iv) *Swertia chirata* (Chirata) Parts used: Whole plant
 - v) *Rauvolfia serpentina* (Sarpagandha) Parts used: Root
 - vi) *Andrographis paniculate* (Kalmegh) Parts used: Leaves and entire aerial parts
 - vii) *Curcuma longa* (Turmeric) Parts used: Rhizome
 - viii) *Cinnamomum tamala* ((Tejpata) Parts used: Leaves
 - ix) *Terminalia arjuna* (arjun) Parts used: Bark
 - x) *Saraca asoka* (Asok) Parts used: Stem Bark
 - xi) *Rubia manjit* (Manjit) Parts used: Root and whole plant

- xii) *Bacopa monnieri* (Brahmi) Parts used: Leaves and shoots
- xiii) *Amomum subulatum* (Large cardamom) Part used: Pod(capsule)
- xiv) *Terminalia chebula* (Haritaki) Parts used: fruit
- xv) *Terminalia bellirica* (Bahera; Belliric myrobalan) Parts used:fruit
- xvi) *Aloe barbadensis* (Aloe vera, Ghritkumari) Part used-Leaves.
- xvii) *Withania somnifera* (Aswagandha) Part used- Root
- xviii) *Holarrhenna antidysenterica* (Kurchi, False rubber tree,holarrhenna) Part used- Bark& seed.
- xvi) *Wedelia chinensis* (Bhringaraj) Parts used- Leaves, wholeplant.
- xx) *Hygrophila schulli* (*Hygrophila auriculata*) Kulekhara Partused- Whole plant
- xxi) *Centella asiatica* (Thankuni) Parts used: Leaves or wholeplant.
- xxii) *Eclipta alba* (Kesut/ Kesuti) Parts used: Whole plant.
- xxiii) *Phyllanthus fraternus* (Bhuiamla/ Bhumi amlaki) Parts used:
Leaves and whole plant
- xxiv) *Ocimum sanctum* (Tulsi, Holy Basil) Parts used: Leaves
- xxv) *Abelmoschus moschatus* (Latakasturi) Parts used: Seeds

1.6. Proper identification methodology

Practical Content:

- Identification of common medicinal plants, parts used, utility.
- List out the importance of medicinal and aromatic plants
- Proper identification methodology
- Explore the uses of various medicinal and aromatic plants: traditional remedies, herbal teas, and culinary purposes, essential oils from aromatic plants and their applications in perfumery, skincare, and aromatherapy products.
- Demonstrate the different techniques of Propagation of selected medicinal and aromaticplants
- Preparing a chart with Growing Area, variety, Alkaloid / essential oil present, season of crop growing
- Prepare chart showing distribution of crops in West Bengal & India

Tools & Equipment:

Land for cultivation (Medicinal & Aromatic Crops garden and processing unit), Power tiller, Nirani/Khurpi, Iron peg, Field board, Wheel hoe, Sickle, Sprayer, Measuring tape, Spade, Processing / Oil extraction machine (Soxhlet Apparatus), Flask (oil container for storing), Balance, Balance, Aluminium oil extraction unit large , Petri dish with lid, Aluminium container, Grinding machine , Beaker, Oven

Module No. 2: Cultivation and Management

Outcome: Demonstrate the procedure of cultivation for growing Medicinal and Aromatic Plants.

Theory Content:

- 2.1. Good Agricultural practices (GAP) in planting:
 - Understand the importance of adhering to good agricultural practices in the planting process.
 - Emphasize soil preparation, spacing, and site selection to optimize plant growth and yield.
 - Implementing GAP ensures the health and quality of the medicinal and aromatic

- plants.
- 2.2. Discuss optimal sowing techniques for different medicinal and aromatic plant species.
 - 2.3. Planting:
 - Explore various planting methods such as direct planting, transplanting, and container gardening.
 - Discuss spacing requirements, depth of planting, and soil amendments during the planting process.
 - Emphasize the need for proper handling and care of seedlings or planting material to ensure establishment.
 - 2.4. Irrigation:
 - Understand the water requirements of different medicinal and aromatic plants at various growth stages.
 - Discuss irrigation methods, scheduling, and water conservation techniques.
 - Importance of maintaining proper soil moisture levels for optimal plant growth and development.
 - 2.5. Weeding:
 - Emphasize the importance of weed management in medicinal and aromatic plant cultivation.
 - Discuss various methods of weed control, including manual, mechanical, and cultural practices.
 - Address the impact of weeds on plant growth, yield, and quality, and the importance of timely intervention.
 - 2.6. Mulching:
 - Explore the benefits of mulching in medicinal and aromatic plant cultivation, such as moisture conservation, weed suppression, and soil temperature regulation.
 - Discuss different types of mulching materials and application methods.
 - Emphasize the role of mulch in improving soil health and overall plant productivity.
 - 2.7. Fertilizer (organic), Pesticides (organic) application
 - 2.8. Green Pesticides: Concept and application
 - 2.9. Preparation of green pesticides from selected Medicinal plants
 - 2.10. Species wise special needs
 - 2.11. Good Harvesting Practices (GHP) concept, application in leaves, roots, rhizome, stem, whole plants, bark
 - 2.12. Species wise good harvesting practices
 - 2.13. Improved cultural hints on Soil, climate, varieties , propagation, nursery technique, sowing, transplanting , nutrient management, irrigation , weeding, intercultural operations , harvesting and yield of Kalmegh, Sarpagandha, Tulsi, Aloe vera, Basak, Periwinkle, Ashwagandha, Isabgul, Stevia, Poppy, Citronella, Lemon grass.

Practical Content:

- Good Agricultural practices (GAP) apply in nursery
- Preparation of Nursery bed using GAP
- Use of Quality planting material
- Application of different types of planting materials
- Application of Best nursery practices
- Application of species wise nursery practices
- Good Agricultural practices (GAP) apply in planting
- Sowing method
- Planting method
- Irrigation method
- weeding method
- Mulching method

- Application Fertilizer (organic) and Pesticides (organic)
- Species wise special technical needs
- Good Harvesting practices (GHP) concept, application in leaves, roots, rhizome, stem, whole plants, bark
- Species wise good harvesting practices

Tools & Equipment:

Land for cultivation (Medicinal & Aromatic Crops garden and processing unit), Power tiller, Nirani/Khurpi, Iron peg, Field board, Wheel hoe, Sickle, Sprayer, Measuring tape, Spade, Processing / Oil extraction machine (Soxhlet Apparatus), Flask (oil container for storing), Balance, Balance, Aluminium oil extraction unit large, Petri dish with lid, Aluminium container, Grinding machine, Beaker, Oven

Module No. 3: Post harvesting Practices

Outcome: Execute Post harvesting Practices for Medicinal and Aromatic Plants.

Theory Content:

- Describe the post-harvesting practices in maintaining the quality and efficacy of medicinal and aromatic plants. Cleaning
- Explain the post-harvesting techniques in preserving the bioactive compounds and extending the shelf life of the harvested plant material.
- Discuss the importance of cleaning harvested plant material to remove contaminants, dirt, and foreign particles.
- Explore various cleaning methods, including washing, brushing, and air blowing, based on the characteristics of the plant material.
- Explain different drying methods such as sun drying, shade drying, and mechanical drying.
- Understand the factors influencing drying efficiency, including temperature, humidity, and airflow.
- Explore techniques for preventing mold growth and ensuring uniform drying to maintain product quality.
- Discuss grading standards and criteria for different medicinal and aromatic plant species.
- Explore packaging materials and methods suitable for preserving the quality and freshness of medicinal and aromatic plants.
- Discuss considerations such as moisture control, ventilation, and protection from light and physical damage.
- Understand the principles of proper storage to prevent spoilage, degradation, and loss of potency in harvested plant material.
- Discuss storage conditions such as temperature, humidity, and ventilation requirements.
- Explore different types of storage facilities, including warehouses, cold storage units, and controlled atmosphere storage.

Practical Content:

- Demonstrate the cleaning of harvested plant material using appropriate equipment and techniques.
- Practice removing debris, soil, and other impurities to prepare the plant material for further processing.
- Execute different drying methods, such as sun drying and mechanical drying, under controlled conditions.
- Monitor drying parameters and adjust as needed to ensure optimal drying efficiency and product

quality.

- Practice grading harvested plant material based on predefined standards and criteria.
- Classify the plant material into different grades according to quality, size, and other relevant factors.
- Apply proper packaging techniques to protect harvested plant material from moisture, contamination, and physical damage.
- Select appropriate packaging materials and ensuring proper sealing and labeling.
- Explore various storage systems and facilities suitable for storing medicinal and aromatic plants.
- Set up and maintain storage conditions, including temperature and humidity control, to prolong shelf life and maintain quality.

Tools & Equipment:

Land for cultivation (Medicinal & Aromatic Crops garden and processing unit), Power tiller, Nirani/Khurpi, Iron peg, Field board, Wheel hoe, Sickle, Sprayer, Measuring tape, Spade, Processing / Oil extraction machine (Soxhlet Apparatus), Flask (oil container for storing), Balance, Balance, Aluminium oil extraction unit large, Petri dish with lid, Aluminium container, Grinding machine, Beaker, Oven

Module No. 4: Value Addition Techniques

Outcome: Prepare different value-added products using various medicinal and aromatic plants.

Theory Content:

- Concept, utility
- Value addition of common plants, different value-added products using Medicinal Plant.
- Preparation of herbal churna (dust)
 Various churnas may be prepared at home using Arjun chal, Aswagandha, Bramhi, Bael soont, Sarpagandha, Tulsi, Gokkhur, Daruchini (Cinnamon), Kababchini (Cubeb).
Some commonly used other dusts: -
 Trifalas (for constipation), Satsakkar churna (for piles), Talisadichurnha (for cough & cold), Baishnachnar churna (for stomach problem), Sarpagandha root dust (for hypertension), Pancha nimba churna (for skin disease), Tulsi & Basak dust (for cough & cold).
- Preparation of Kwath (water decoction) / Pachan
 Basak kwath (cough & cold, acidity), Pathya Saranga kwath (headache & Migraine), Bhuin amla (jaundice).
- Preparation of Tablet / Pills
 Kalmegh pills (Liver problem), Nimba kadi pills (Skin disease), Khader pills (Mouth sore)
- Preparation of Medicated oil
 Batari Tel (for Knee & Joint Pain, Arthritis)
- Preparation of Immunity booster
 Amlaki, Garlic preparation (Immunity booster)
- Preparation of Nutraceuticals & soft drinks using cheap ingredients + medicinal herbs
 Laddu, Barfi, Omlet, Khichuri, Nutramix, Herbal drink

Practical Content:

- Prepare herbal churna by grinding equal parts of Arjun chal, Ashwagandha, Brahmi, Bael, Soont, Sarpagandha, Tulsi, Gokshura, Cinnamon, and Kababchini, storing them in an airtight container for various health benefits.
- Boil Basak, Pathya Saranga, and Bhui Amla in water to create a therapeutic kwath (decoction) that can alleviate symptoms of cough, cold, headache, migraine, and jaundice when consumed regularly.
- Craft tablets or pills using powdered herbs like Kalmegh, Nimba Kadi, and Khader mixed with honey or ghee, offering convenient and precise dosing for liver problems, skin diseases, and mouth sores.
- Prepare medicated oil by infusing crushed herbs for joint pain and arthritis, such as Batari Tel, into a base oil like sesame or coconut oil, providing a soothing and effective topical remedy.
- Enhance immunity by combining crushed Amla and garlic cloves, consuming a teaspoon daily on an empty stomach to bolster the body's defense mechanisms against infections and diseases.

Tools & Equipment:

Land for cultivation (Medicinal & Aromatic Crops garden and processing unit), Power tiller, Nirani/Khurpi, Iron peg, Field board, Wheel hoe, Sickle, Sprayer, Measuring tape, Spade, Processing / Oil extraction machine (Soxhlet Apparatus), Flask (oil container for storing), Balance, Balance, Aluminium oil extraction unit large, Petri dish with lid, Aluminium container, Grinding machine, Beaker, Oven

Module No 5: 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 No 6 : 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	Identify, classify and list out the importance of Medicinal and Aromatic Plants.	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1 Identify and classify medicinal and aromatic plants. 1.2 Explain the Importance of Medicinal and Aromatic Plants. 1.3 Use medicinal and aromatic plants in traditional remedies, herbal teas, culinary purposes, perfumery, skincare, and aromatherapy products. 1.4 Discuss current cultivation trends and market demand for medicinal and aromatic crops.
2	Demonstrate the procedure of cultivation for growing Medicinal and Aromatic Plants	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1 Demonstrate proper nursery bed preparation. 2.2 Apply optimal sowing techniques for varied medicinal and aromatic plant species. 2.3 Execute effective irrigation practices tailored to specific plant water requirements. 2.4 Apply diverse weed management techniques for optimal plant growth. 2.5 Practice species-specific Good Harvesting Practices (GHP). 2.6 Apply suitable planting methods like direct,

Module No.	Outcome	Assessment Criteria
		transplanting, or container gardening.
3	Execute Post harvesting Practices for Medicinal and Aromatic Plants.	<p>After completion of this module students will be able to:</p> <p>3.1 Clean harvested plant material using appropriate methods.</p> <p>3.2 Demonstrate various drying techniques such as sun drying and mechanical drying.</p> <p>3.3 Grade the harvested plants based on established standards.</p> <p>3.4 Execute proper packaging procedures to safeguard against moisture, contamination, and physical harm.</p> <p>3.5 Demonstrate proper storage procedure to safeguard against moisture, contamination, and physical harm.</p> <p>3.6 Set up and manage storage conditions including temperature and humidity control.</p>
4	Prepare different value-added products using various medicinal and aromatic plants.	<p>After completion of this module students will be able to:</p> <p>4.1 Assess the variety of herbal churna prepared.</p> <p>4.2 Evaluate the effectiveness of the kwath decoctions</p> <p>4.3 Examine the quality and consistency of the tablets or pills made.</p> <p>4.4 Assess the potency and application of the medicated oils.</p> <p>4.5 Evaluate the immune-boosting potential of the Amla and garlic.</p> <p>4.6 Analyze the creativity and nutritional value of the nutraceuticals and soft drinks.</p>
5	OJT	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.)
6	Employability Skill	As per guided curriculum

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

SI No	Items Name	Specification	Qty
1	Land for cultivation (Medicinal & Aromatic Crops garden and processing unit)	Fertile, high or medium high land	1(one) bigha + 1(one)

SI No	Items Name	Specification	Qty
			bigha
2	Power tiller		one
3	Nirani/Khurpi	According to specific crop	20
4	Iron peg , Field board	According to specific crop	75
5	Wheel hoe	According to specific crop	two
6	Sickle		30
7	Sprayer	15 L	2
8	Measuring tape	50 m	2
9	Spade		20
10	Processing / Oil extraction machine (Soxhhlet Apparatus)	According to specific size & crop Big & small	3
11	Flask (oil container for storing)	Different size	10
12	Balance	0.5 – 100 kg	two
13	Balance	0.01 – 100 g	one
14	Aluminium oil extraction unit large		one
15	Petridish with lid	Tarson	100
16	Aluminium container	Small & large	15
17	Grinding machine	Medium & large	1+1 =2 (Two)
18	Beaker	500 ml, 250 ml, 100 ml	5 + 5 + 10
19	Oven	160 L (40°C - 140°C)	1+1 =2

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Identify, classify and list out the importance of Medicinal and Aromatic Plants.	AGR/0270/OC1	50	150	0
Demonstrate the procedure of cultivation for growing Medicinal and Aromatic Plants.	AGR/0270/OC2	40	190	0
Execute Post harvesting Practices for Medicinal and Aromatic Plants.	AGR/0270/OC3	20	140	0
Prepare different value-added products using various medicinal and aromatic plants.	AGR/0270/OC4	40	170	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	AGR/0270/OC5	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0