

SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE



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PART-TWO

Thursday, the 2nd August, 2012

NOTIFICATION

No.108/2012

Dated :2/8/2012

SUBJECT: SYLLABI FOR CERTIFICATE/DIPLOMA/ ADVANCED DIPLOMA COURSE IN "NURSERY MANAGEMENT AND PROCESSING OF MEDICINAL AND AROMATIC PLANTS" UNDER THE SCHEME OF CAREER ORIENTED PROGRAMME AT FIRST DEGREE LEVEL SPONSORED BY U.G.C.

It is notified for general information of all concerned that the authorities of University have accepted the syllabi prescribed earlier for Certificate/Diploma/Advanced Diploma Course in "Nursery Management and Processing of Medicinal and Aromatic Plants" along with other details under the scheme of career oriented programme at first degree level shall be as given in Appendix-A, appended with this notification.

It is further notified that the eligibility criteria and other details along with the Scheme of examination shall be as provided under Ordinance No.47 of 2005, Regulation No.38 of 2005, Direction No.6/2008 and 7/2008.

Sd/-
(Dineshkumar Joshi)
Registrar,
Sant Gadge Baba Amravati University

Appendix-A

Syllabus Prescribed For Certificate Course in "Nursery Management and Processing of Medicinal and Aromatic Plants"

MAXIMUM MARKS-100

- Unit I : Historical background and scope of medicinal plants; importance of medicinal plants; techniques for collection of plant parts, selection, storage techniques. Documentation of local medicinal and aromatic plants and their uses.
- Unit II : Cultivation principles and techniques of medicinal and aromatic plants, soil practices, soil profile and testing, manure mixture and manuring, preparation of beds in garden and green house, potting and repotting.
- Unit III : Planting procedure and techniques, transplanting practices, growth study, importance of medicinal and aromatic plants propagation, cultivation practices for medicinal plants.
- Unit IV : Nursery techniques for plant propagation; pruning, potting, crop scheduling, weeding; plant pathology-fungal diseases of medicinal plants.
- Unit V : Preparation of crude herbal drugs, packing and transport. Market survey, centres of medicinal plants - CIMAP, AYUSH; Quality control measures.

PRACTICALS :

- 1) To study pH of soil by pH meter.
- 2) To study any five local medicinal and aromatic plants.
- 3) To study moisture holding capacity of soil by soil tensiometer.
- 4) To study soil texture by sieve method.
- 5) To study plant pathology of medicinal and aromatic plants (list of some aromatic plants- 1) Ruta graveolens, 2) Cymbopogon martini 3) Ocimum sanctum 4) Cymbopogon citratus 5) Hyptis suaveolens 6) Pogostemon plactrenthoides 7) Aegle marmelos 8) Boswellia serrata 9) Vitex negundo 10) Murraya paniculata)
- 6) To study biomass production in cultivated medicinal plants (List of some medicinal plants - 1) Tinospora cordifolia 2) Andrographis paniculata 3) Ruta graveolens 4) Aloe vera 5) Tridax procumbens 6) Asparagus recemosus 7) Withania somnifera 8) Costus speciosus 9) Plumbago Zeylanica 10) Ricinus communis 11) Semecarpus anacardium

- 7) To study moisture content of cultivated medicinal and aromatic plants.
- 8) To prepare digital herbarium of any 25 local medicinal and aromatic plants.
- 9) To prepare herbarium sheets of any 25 local medicinal and aromatic plants.
- 10) To study morphology of medicinal plant parts.

Practical Examination:

Time : 04 HRS

MAX. MARKS- 50

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|--|-----------|
| Q.1- Any one experiment on soil study | 10 marks. |
| Q.2- Any one experiment on nursery techniques. | 10 marks |
| Q.3 - Any one experiment on medicinal/ aromatic plants . | 10 marks |
| Q. 4- To study the plant pathology of medicinal and aromatic plants. | 10 marks. |
| Q.5- Viva- voce , practical record and field report. | 10 marks |

Project :- 50 Marks

- 1) Documentation (Collection, Identification, Photography and Field diary) of local medicinal plants.
- 2) Visit to Pharmaceutical Industry or Herbal Medical Garden
- 3) Visit to any medicinal plant processing Industry.

REFERENCE BOOKS :

1. Hartman and Kester - plant propagation ; principles and practices.
2. Garner R.J. - The propagation of tropical fruit trees.
3. Prasad - medicinal plants principles and practices
4. Dhore M. A. - Flora of Melghat Tiger Reserve.
5. Kartikeyan - Flora of Maharashtra , Vol. I , II AND III.
6. S. K. Jain - Medicinal plants.
7. Dr. Anil Korpenwar - A text book of Botany .Atharva publication Dhule.
8. P.D. Sharma - text book of Ecology and environment.
9. H.C. Dubey - Plant pathology.
10. P.K. WARRIER - Indian medicinal plants.
11. A.S. Sandhu and A. P. Singh - A Dictionary of medicinal plants.
12. Jain S. K. and V. Mudgal - A Hand book of Ethnobotany.
13. V. Prasad .- A manual of medicinal trees.
14. R.C. Bhade - Agrotechniques of medicinal plants.
15. H. Panda - Aromatic plants cultivation , processing and uses .
16. R.N. PATI AND D. N. TIWARI - conservation of medicinal plants.
17. H. Panda - Cultivation and utilization of aromatic and medicinal plants.
18. V. N. Naik - Marathwadyatil Divya Vanaushadhi.
19. Muratkar G. D. - Medicinal plants of Melghat Forest.

Syllabus Prescribed for Diploma Course in "Nursery Management and Processing of Medicinal And Aromatic Plants"

- Unit I : Ethnobotany - Concept , scope and importance ; principles and methods for conservation of medicinal and aromatic plants. Herbal gardens and govt. policies.
- Unit II : Diversity of medicinal and aromatic plants , assessment of diversity; Chemical composition of medicinal plants – Catharanthus roseus, ocimum sanctum, murraya paniculata, adiantum vasicum, azadirachta indica, curcuma pseudomontana, rauwolfia serpentina, asparagus racemosus, alove vera, gloriosa superba, withania somnifera, datura metel, Andrographis paniculata, tinospora cordifolia, Chlorophytum tuberosum .
- Unit III : Principle , techniques and types of chromatography and spectroscopy.
- Unit IV : Secondary metabolites – concept and importance , chemical structure and uses of secondary metabolites.
- Unit V : Modern nursery techniques for large scale cultivation of medicinal and aromatic plants; agrotechnology for cultivation of Catharanthus roseus, ocimum sanctum, murraya paniculata, rauwolfia serpentina, asparagus racemosus, alove vera, withania somnifera, datura metel, Andrographis paniculata, Chlorophytum tuberosum.
- Sustainable harvesting practices, storage methods , marketing.

Practicals :

- 1) To study soil nutrients (N, P, K) Preliminary phytochemical analysis of locally available medicinal and aromatic plants.
- 2) Extraction and separation of secondary metabolites by soxhlet method.
- 3) Cultivation of medicinal and aromatic plants in Nursery beds.
- 4) To study Harvesting techniques of medicinal plants.
- 5) To study the drying techniques for medicinal plants.
- 6) Demonstration of packing techniques.
- 7) To study working principle of Spectrophotometer.
- 8) To study working principle of TLC and paper chromatography.
- 9) Oil extraction from aromatic plants by soxhlet method.
- 10) To study moisture content of medicinal and aromatic plant parts.

Project Work / Field work :

- Local market survey of medicinal and aromatic plants / products.
Development of Agrotechnology of Medicinal plants.

Practical Examination :

Time – 04 Hrs.

Total marks – 50

Q.1- Any one experiment on Phytochemistry of Medicinal and Aromatic plants.	20 marks.
Q.2 – Any one experiment on Nursery techniques of medicinal and aromatic plants.	10 marks.
Q.3- Any one experiment on analytical techniques.	10 marks
Q.4 – Practical record , field report and Viva voce .	10 marks.

Reference Books :

1. Biochemical methods – Themaiya.
2. Biochemical methods – Sadashivam and Manikam
3. A text book of Quantitative inorganic analysis – I.A. Vogel.
4. Quantitative analysis – Day and Underwood.
6. Instrumental methods of Analysis – W. Merritt and Dean.
7. Hand Book of Drugs and Cosmetics – Mehrotra.
8. Practical Pharmacology – T. N. Vasudevan.

Syllabus Prescribed for Advance Diploma Course in "Nursery Management And Processing of Medicinal And Aromatic Plants"

- Unit I : Biodiversity- Scope, Concept; Biodiversity Act; Factors affecting plant diversity; Biodiversity conservaton- principles and methods; Role of human being in biodiversity conservation; hot-spots of biodiversity in India.
- Unit II : Seed Morphology, Germination; Seed storage, Seed Bank- Concept and Importance; Seedling morphology, Mortality and survival; Factors affecting seedling growth; Nutritional requirements.
- Unit III : Micromorphology of Medicinal and aromatic plants- Morphological, anatomical. Importance of Medicinal and Aromatic Plant identification.
- Unit IV : Metabolic Engineering of Medicinal and aromatic plants- tools and techniques; Industrial importance of plant derived products, value addition, patent, IPR, Authentication of herbal drugs.
- Unit V : Herbal medicines- Scope and limitations, WHO- Role in Facilitation of herbal medicines, Indian System of Medicine, Traditional Knowledge Of Medicinal Plants, Natural Resources- as a source of income, Medicinal and aromatic plant trade.

Practicals :

1. To study Principle and technique of Spectrophotometer.
2. To study Principle and technique of HPLC.
3. To study Principle and technique of Flame Photometer.
4. To study histochemistry of medicinal plant parts.
5. To study histochemistry of aromatic plant parts.
6. To study the technique of extraction and separation of chemical compounds of medicinal plants.
7. To study the technique of extraction and separation of chemical compounds of Aromatic plants.
8. To Study the morphology of medicinal plants- Asparagus racemosus, Adhatoda vasica, Ruta graveolens, Azadirachta indica, Ocimum sanctum, etc. (Any other locally available medicinal plants).
9. To Study the morphology of Aromatic plants- Hyptis suaveolens, Cymbopogon martini, C. citritus, Vetiveria zanzoides, Boswellia serrata, Murraya koenigi i etc. (Any other locally available aromatic plants).
10. To study the seed morphology of locally available medicinal plants.
11. To study the seed morphology of locally available aromatic plants.
12. To study the seed germination techniques of locally available medicinal plants.
13. To study the seed germination techniques of locally available aromatic plants.

Project Work / Field work :

50 Marks

1. Collection of Medicinal and aromatic plant seeds and development of seed bank.
2. Phytochemical analysis of any one medicinal/aromatic plant.

Practical Examination :

Time – 04 Hrs.

Total marks – 50

Q.1- Any one experiment on Histochemistryof Medicinal and Aromatic plants.	10 marks.
Q.2 – Any one experiment on principles and techniques of Instrumentation.	10 marks.
Q.3- Any one experiment on Medicinal and Aromatic plants Morphology.	10 marks
Q.4 – Any one experiment on seed morphology and germination of Medicinal and Aromatic plants.	10 marks.
Q. 5. Practical Record, Field Work and Viva-Voce	10 marks

Reference Books :

1. Biochemical methods – Themaiya.
2. Biochemical methods – Sadashivam and Manikam
3. A text book of Quantitative inorganic analysis – I.A. Vogel.
4. Quantitative analysis – Day and Underwood.
6. Instrumental methods of Analysis – W. Merritt and Dean.
7. Hand Book of Drugs and Cosmetics – Mehrotra.
8. Practical Pharmacology – T. N. Vasudevan.
9. Biodiversity and Conservation – A. B. Lal
10. Climate Change and Biodiversity- N. B. Bhusari, Chandralok Publ., Kanpur.