

# NANDINI NAGAR MAHAVIDYALAYA

NAWABGANJ, GONDA, U.P. - 271303

M.Sc. (Ag.) Horticulture



## SYLLABUS

:: AFFILIATED TO ::

Dr. R.M.L. Avadh University, Faizabad

From Session-2006-07

68 Sainy  
PRINCIPAL

Nandini Nagar Mahavidyalaya

R.A.K. (Signature)

2

## CONTENT

### Ordinance Governing For M.Sc. (Ag) Horticulture

Sr. No.	Particulars	Page No.
1.	Admission Rule	01
2.	Examination Rule	02-03
3.	Scheme of Examination	04-05
4.	Courses of Study (Syllabus for part-I)	06-09
5.	Courses of Study (Syllabus for part-II)	10-12

*Ju*

*G. B. Sisvrolan*  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWABGANJ-GONDA

## Admission Rules

1. The course leading to the Master of Science in Agriculture (Horticulture) degree shall extend over two academic years.
2. For eligibility to enter the Master of Science in Agriculture (Horticulture) course a candidate must have passed the B.Sc. (Ag)/ B.Sc.(Hort.) examination with 50% marks from any recognised university.
3. Not more than 40 candidates should be admitted provided they qualify as per university rules.
4. This course will be completed in two years , the details of the different papers studied are as follows -
  - A- **M.Sc. (Ag) Horticulture Part I ( Previous Year)**
    - Paper- I Olericulture I - Fundamentals and Principles.
    - Paper - II Olericulture II -Vegetable Crops.
    - Paper - III Pomology - Principles and Fundamentals.
    - Paper - IV Fruit Crops and Their Cultivation.
    - Paper- V Fruit Technology.
  - B- **M.Sc. (Ag) Horticulture - Part II (Final Year)**
    - Paper-I Nursery Husbandry.
    - Paper-II Orchard Management.
    - Paper-III Floriculture.
    - Paper-IV Land Scaping & Ornamental Gardening.



(1)

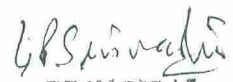
G. Srinivasan  
Principal  
K. J. Somaiya Institute of Technology  
Mumbai

## Examination Rules

1. The examination for the degree shall consist of two parts.
  - (i) M.Sc. (Ag) (Horticulture) Part - I
  - (ii) M.Sc. (Ag) (Horticulture) Part - II
2. Candidate will take M.Sc. (Ag) Part- I (Previous year) examination at the first year of the course & M.Sc. (Ag) Part- II (Final year) at the end of second year of the course.
3. A candidate shall be eligible for appearing at the Part I examination for the M.Sc.(Ag) (Horticulture) degree , if he/she has passed B.Sc. (Ag) / B.Sc.(Hort.) examination.
  - (a) Being selected on the basis of admission tests prevailing in the year when admission is sought in the college.
  - (b) There should be minimum of 75% attendance in the theory & practical classes separately.
4. A candidate who after passing M.Sc. (Ag) (Horticulture) Part I exam. has completed regular course of studies for one academic year and has put in a minimum of 75% attendance in theory & practical separately shall be eligible for appearing in part II examination for the M.Sc. (Ag.) Horticulture.
5. There shall be annual examination at the end of each year and a candidate will have to pass separately in Part-I (Previous year ) and Part-II (Final year) examination { separately in theory & practical}.
6. Candidates who will not complete 75% attendance in theory and practical separately will not be allowed to appear at the final examination.
7. The result of examination shall be given separately in mark sheets for each year under two heads {Theory & Practical}.
8. The degree will include the division on the basis of aggregate marks obtained in M.Sc. (Ag) Horticulture part I & II all the part i.e.
  - (A) Theory
  - (B) Practical



(2)

  
PRINCIPAL  
Mardani College of Horticulture  
HAWANDEGA, S. P. D. A.

To pass in theory papers in each of part I & II examination the candidate must secure at least 36% marks in theory and practical separately .

9 . The candidates are permitted to write their answer in Hindi/English medium .

10. If a candidate is failing in any one theory paper by getting less than pass marks, he will be declared successful by giving maximum 06 % marks as grace in Part I (Previous Year).

11. In M.Sc. (Ag) Horticulture Part I & II the candidates must obtain 36% marks in part A theory & practical separately shall be declared successful. The unsuccessful candidate shall be permitted to avail the facilities of re-examination in one theory paper under marks/division improvement.

12. A candidate must complete the course of study for the degree of Master of Science in Agriculture ( Hort.) and pass the final examination with in a total period of four years commencing from his/her first admission in the M.Sc. (Ag) Horticulture.

13. The division shall be assigned to the successful candidates on the following basis.

Third division - 35% and above but below 48% of the aggregate marks.

Second division - 48% and above but below 60% of the aggregate marks.

First division - 60% and above of the aggregate marks.

Distinction 75% or above.

A student securing 75% or above in any paper shall be declared to have obtained distinction in that provided he/she passed in all the papers in the first attempt and this fact shall be mentioned in the degree.

Distinction obtained in any theory papers shall be mentioned in the degree awarded to the candidates.

The marks of the part I and part II examination of theory & practical respectively M.Sc. (Ag) Horticulture will count together for a place on the basis of pass list for determination of division.

(3)

G. P. Srivastava

PRINCIPAL

Nandini Nagar Mahavidyalaya

NAWABGANJ-GONDA

# SCHEME OF EXAMINATION

FOR

## M.Sc. (Ag) Horticulture Part I ( Previous Year)

### Part A Theory

	Max. Marks	Min.Pass Marks
Paper- I Olericulture I - Fundamentals and Principles.	100	36
Paper - II Olericulture II -Vegetable Crops.	100	36
Paper - III Pomology - Principles and Fundamentals.	100	36
Paper - IV Fruit Crops and Their Cultivation.	100	36
Paper- V Fruit Technology.	100	36
<b>Total</b>	<b>500</b>	<b>180</b>

### Part B Practical

Combined practical on basis of theory paper I, II, III, IV & V

	200	72
<b>Total</b>	<b>200</b>	<b>72</b>
<b>Grand total</b>	<b>700</b>	<b>252</b>



(4)

*G. P. S. Swain*  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWABGANJ GONDY

# SCHEME OF EXAMINATION

FOR

**M.Sc. (Ag) Horticulture**  
**Part II ( Final Year)**

## Part A Theory

	<b>Max. Marks</b>	<b>Min.Pass Marks</b>
Paper-I Nursery Husbandry.	100	36
Paper-II Orchard Management.	100	36
Paper-III Floriculture.	100	36
Paper-IV Land Scaping & Ornamental Gardening.	100	36
Total	400	144

## Part B Practical

Combined practical on basis of theory paper I, II, III & IV	200	72
Total	200	72
<b>Grand total</b>	<b>600</b>	<b>216</b>



(5)

*U. S. S. S. S.*  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWARGANDE, GUNDA

# SYLLABUS

M.Sc. (Ag) Horticulture

Part-I (Previous Year)

*Handwritten mark*

(6)

*Handwritten signature*  
PRINCIPAL  
Nandini Nagar Bahavidyalaya  
NAWABGANJ GONDA



## Syllabus for M.Sc. (Ag.) Horticulture Part I (Previous Year)

### PAPER I: OLERICULTURE I- FUNDAMENTALS AND PRINCIPLES

**Unit I :** Scope and importance of vegetable, Role of vegetable in human nutrition .  
Classification of vegetables, Types of vegetable garden , climatic requirement, soil and manuring, irrigation practices, weed and pest control.

**Unit II:** Maturity, harvesting, handling, storage and mobility. Vegetable forcing, importance, scope. A plant growing structure, hot beds, cold frames, glass house, green house, river bed cultivation, hydroponics, mushroom cultivation.

**Unit III:** Method of vegetables breeding, role of plant introduction, selection procedure, hybridization and back cross procedure.

**Unit IV:** Dormancy and germination of vegetable seeds, tubers and bulbs, role of light and temperature in growth of vegetable crops, use of plant growth regulators.

**Unit V:** Maturity, harvesting and preparation of vegetables, washing, trimming, blanching, grading, waxing, stability etc. Factors responsible for deterioration of harvested vegetables.

**Practical-** As Prescribed. ?

### PAPER II: OLERICULTURE II-VEGETABLE CROPS.

**Unit I:** Study of summer vegetables, importance, origin history, climate, commercial varieties, Nutrition and other cultural operations reported by research findings on summer crops like solenacious vegetables okra, cucurbits, sweets potato, beans, cowpeas and leaf vegetables.

**Unit II:** Winter vegetables, importance, origin, history, climate, commercial varieties. nutrition and other cultural practices supported by research findings on winter vegetables, potato, Cole crop, root crop, onion, garlic and leafy vegetables.

**Unit III:** Position of vegetable seed industry, Problems in vegetable seed production, specific methods of seed production in importance vegetable crops.

**Unit IV:** Production of nucleus seed, seed testing procedure, vegetable seed distribution and trade, role of NSC.

**Unit V:** Study of minor vegetables like Asparagus celery, Brussels sprout, ortichoke, tapioca dioscoria, Colocasia etc.

**Practical-** As Prescribed ?

*[Handwritten signature]*

*[Handwritten signature]*  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWABGANI-GONDA

### PAPER III: POMOLOGY-PRINCIPLES AND FUNDAMENTALS

**Unit I:** Importance of present position and future scope of fruit industry. General survey of fruits grown in India with special reference to climatic conditions, localization of productions and accomption.

**Unit II:** Application of plant regulators especially portaining to their uses in rooting flowering, fruit set, fruit development, parthenocarpic fruits etc. Thining of fruits quality regulation and maturity etc.

**Unit III:** Deficiency symptoms of essential nutrients and their correction to horticultural plants, effect of individual essential on cropping and quality of fruits.

**Unit IV:** Maturity and ripening process and factors affecting them. Quality cultivation for fresh market and processing. Factors responsible for deterioration of harvested fruits. Respiration and transpiration storage of fresh fruit.

**Unit V :** Discussion on the topic of special interest in horticulture like root stocks and scion relationship, incompatibility, problem of alternate bearing, dormancy and rest period in fruit crop.

Practical- As Prescribed 2

### PAPER IV: FRUIT CROPS AND THEIR CULTIVATION

**Unit I:** Tropical and sub-tropical fruits, origins, history and distribution of mango, litchi, loquat, guava, papaya, banana, ber and date fruits and their classification, nomenclature and cultivation environmental factors and their effects on the cultivation and other aspects as blooming and ripening and tree longevity, propagation, Nutrition and irrigation of these fruits crop with their special problems.

**Unit II:** Temperate fruits, origins, history and distribution of apple, peach, pear, plum and apricot their classification, climatic requirement, nomenclature and cultivation. propagative nutrition and irrigation.

**Unit III:** Viticulture, importance, origin, history, distribution, and cultivation of grapes. classification and characteristics of species and cultivars, propagation, harvest, means of improving fruit quality, maturity, and root stock, establishing the vineyards, nutrition, irrigation and soil requirements, training and pruning, insect pests and disease, harvesting, packing, storage, raising and wire making.

**Unit IV:** Citriculture, importance, origin, history and distribution of citrus, climate, soil requirement, propagation, training, pruning of trees, insects and diseases of citrus and their control. Special problems of citriculture like fruit drops, citrus decline method of improvement production of nuclear seedlings.

**Unit V:** Study of special problems in the fruit like mango, papaya, loquat, apple, grapes and citrus. The cultivation of plantation crops.

Practical- As Prescribed 2

(8)



*G. S. S. S. S.*  
PRINCIPAL  
Mandini Nagar Mahavidyalaya  
HAWABGANI-GONDA

**PAPER V: FRUIT TECHNOLOGY**

**Unit I:** History, present position and future scope of fruit and vegetables preservation industries in India. Principles of fruits and vegetables preservation.

**Unit II:** Canning and bottling of fruits and vegetables, brief history of scientific canning equipment for home. Canning and commercial production, important consideration for laying out of canny. Canning of important fruits, vegetables, spoilage in canned fruits and vegetables.

**Unit III:** fruits and vegetables juices, unfermented beverages (sweetened and unsweetened), principles of preservation, home and commercial scale equipment for juices, preparation and preservation of juices, squashes and cardials from citrus fruit, mango, phalsa, jamun, grapes, pomegranate, tomato etc. Fruit juice concentrates and their general methods of preparation.

**Unit IV:** Jams, jellies and marmledes, role of pectin, sugar and acid in jelly formation, general method of preparation of james, jellies and marmledes, use of jelly meter etc. Equipment for home and commercial production.

**Unit V:** Pickles, sauces, chutney and vinager, central principles equipments and method of preparation, butter, preserved and canned fruits, general principles and methods of preparation by product from fruit and vegetables waste in home and commercial production and sun drying and dehydration of fruits and vegetables, equipments and methods.

~~\*~~  
**Practical-** As Prescribed ?



# SYLLABUS

M.Sc. (Ag) Horticulture

Part-II (Final Year)

*Handwritten mark*

(6)

*G. S. Srinivasulu*  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWABGANJ-GONDA

Syllabus for M.Sc. (Ag.) Horticulture Part II (Final year)

**PAPER I : NURSERY HUSBADRY**

- Unit I : Nursery industry in India important of fruit plants nurseries. Selection of Site, layout of nurseries, Preparation of soil, Raising nursery plants by seeds and vegetative methods. polyembryony and its importance in fruit growing.
- Unit II : Influence of stock of scion and vico-vorsa, stenaio incompatibility role of mother plants in nursery establishments.
- Unit III : Dormancy method of overcoming it. Different methods of cutting, budding, layering and grafting physiology of rootage and graftage.
- Unit IV : Role of polythine and mist techniques in plant propagation marketing of nursery plants and seeds.
- Unit V : Care of nursery plants manuring, irrigation transplanting in beds and pots, protection against insect pest diseases and advers weather conditions, lifting packing and transport of nursery plants.

Practical - As prescribed ?

**PAPER II : ORCHARD MANAGEMENT**

- Unit I : Principles underlying successful management of orchard, selection of site of location, planning, selection of planting material, preparation of soil, layout of pits and planting.
- Unit II : Care and protection of young plants, irrigation of orchard, time, amount and methods, water requirements of fruit plants abnormalities caused by excess and deficiency of moisture.
- Unit III : Mannurial requirements of fruit trees organic manures and inorganic fertilizers, major and minor nutrient deficiency and their foliar feedings. Cultivation of orchard soil, intercrop, fillers and cover crops. Protection from pests, Diseases and adverse weather condition
- Unit IV : Problem of unfruitfulness, internal and external factors influencing bearing irregular bearing of fruit trees, pollinisers, bee and pollination self sterility.
- Unit V : Parthenocarp and seedlessness, fertilization and its effect on seed and fruit development, fruit drop and its control splitting, of fruit and its control, rejuvenation of uneconomic orcherds top and frame working.

Practical - As prescribed ?

*[Handwritten signature]*

*G.P. Srinivasan*  
 PRINCIPAL  
 Mandini Nagar Mahavidyalaya  
 NAWABGANJ GONDA

**PAPER III : FLORICULTURE**

Unit I : Floriculture - its importance and scope. Plants and check for environmental pollution.  
Principle of exhibition.

Unit II : Classification, Improvement and Cultivation:  
(a) Rose (b) Dahlia (c) Gladiolus (d) Marigold

Classification, Improvement and Cultivation:  
(a) Chrysanthemum (b) Jasmines (c) Canna (d) Geranium (e) Bougainvillea

Unit III : Cultivation of seasonal flowers, ornamental bulbous and foliage plants, Cacti, succulents, shrubs, climbers and flowering trees.  
Control of disease and pest of ornamental plants.

Unit IV : Preparation packing of ornamental nursery plants, cut flower and their uses of decoration and preparation for transport and marketing in the country and abroad.

Unit V : Breeding for improvement of ornamental plants, response of important flowers to Environmental changes.  
Practical - As prescribed

**PAPER IV : LANDSCAPING AND ORNAMENTAL GARDENING**

Unit I : The history and development of different styles and their characteristics . The formal styles of gardening essentials and accessories, designing and arrangement of formal gardens including building design, hedge and path, topiary, statuary terraces, formal tanks and fountains and other architectures.

Unit II : The landscape gardening, principles and practices, planning of landscape, planting design use and selection of plant materials for colour and of form, proper use of colour and water in landscape gardening, making and maintenance of water garden.

Unit III : A simple knowledge of nursery construction and water display, rock garden, herbaceous borders and shrubberies. detailed study of the planting material and arrangement of parks and bungalow compounds.

Unit IV : Aesthetic planning of roads, canals, and bungalow compound aesthetic planning of road, canals and clinic roads and planting of boulevards of the cities.

Unit V : Town planning, indoor gardening and house plants.  
Practical - As prescribed

G.P. Srinivasulu  
Principal  
Nandipati - 515 001  
NARAYANA-GUNDA

①

Ph. No. (05260)274489



नन्दिनी नगर महाविद्यालय नवाबगंज, गोण्डा (उ.प्र.)  
NANDINI NAGAR MAHAVIDYALAYA NAWABGANJ GONDA. (U.P.)

पत्रांक : Memo/017

दिनांक 22/05/2017

सेवा में,

कुलसचिव,

डॉ० राम मनोहर लोहिया अवध विश्वविद्यालय,

फैजाबाद।

महोदय,

अवगत कराना है कि इस महाविद्यालय में संचालित एम.एस-सी. (कृषि)-उद्यान के छात्रों के द्वितीय वर्ष में वैकल्पिक प्रश्न पत्र न होने के नाते कृषि अनुसंधान परिषद् द्वारा नेट की परीक्षा नहीं दे पाते ऐसी दशा में छात्रहित को दृष्टिगत रखते हुए एम.एस-सी. (कृषि)-उद्यान भाग-2 में पाचवें प्रश्न पत्र के रूप में आरगैनिक हल्टीकल्चर अथवा पोष्ट हारवेस्ट टेक्नोलाजी फार फूड क्राफ्ट को पाठ्यक्रम में शामिल करने का कष्ट करें। जिससे छात्र नेट की परीक्षा में भाग ले सकें।

IICAC

23/5/17

भवदीय

  
PRINCIPAL  
Nandini Nagar Mahavidyalaya  
NAWABGANJ-GONDA

# SCHEME OF EXAMINATION

FOR

**M.Sc. (Ag) Horticulture Part-II (Final Year)**

Part A Theory		Max. Marks	Min. Pass Marks
	<b>Paper Name</b>		
Paper-I	Nursery Husbandry	100	36
Paper-II	Orchard Management	100	36
Paper-III	Floriculture	100	36
Paper-IV	Land Scaping & Ornamental Gardening	100	36
Paper-V	<b>Special Paper</b>	100	36
<b>(Optional)</b>			
	(A) Orgaanic Horticulture		
	OR		
	(B) Post Harvest Technology for Fruit Crops		
Total		500	180
<b>Part B Practical</b>			
	Combined Practical on Basis of Theory Paper I, II, III, IV & V	200	72
Total		200	72
<b>Grand Total</b>		<b>700</b>	<b>252</b>

W. S. S. P. / 23/5/2017  
 J. S. S. P. / 23/5/2017  
 J. S. S. P. / 23/5/2017



M.Sc. Ag II Horticulture.  
OPTIONAL PAPER I A

3

~~OPTIONAL A~~ ORGANIC HORTICULTURE

**Objective**

To develop understanding of organic horticulture production system including GAP.

**Theory**

UNIT I

Organic horticulture – definition, synonyms and misnomers, principles, methods, merits and demerits.

UNIT II

Organic farming systems, components of organic horticultural systems, different organic inputs, their role in organic horticulture, role of biofertilizers, biodynamics and the recent developments.

UNIT III

EM technology and its impact in organic horticulture, indigenous practices of organic farming, sustainable soil fertility management, weed management practices in organic farming, biological/natural control of pests and diseases, organic horticulture in quality improvement.

UNIT IV

GAP - Principles and management, HACCP exercise, certification of organic products and systems, agencies involved at national and international levels, standards evolved by different agencies.

UNIT V

Constraints in certification, organic horticulture and export, IFOAM and global scenario of organic movement, post-harvest management of organic produce.

**Practical**

Features of organic orchards, working out conversion plan, Input analysis-manures, nutrient status assessment of manures, biocomposting, biofertilizers and their application, panchagavya preparation and other organic nutrients application, methods of preparation of compost, vermicompost, green manuring, preparation of neem products and application, BD preparations and their role, EM technology and products, biological/natural control of pests and diseases, soil solarization, frame work for GAP, case studies, HACCP analysis, residue analysis in organic products, documentation for certification, visit to fields cultivated under organic practices

**Suggested Readings**

- Claude A, Vandana S, Sultan I, Vijaya L, Korah M & Bernard D. 2000. *The Organic Farming Reader*. Other Indian Press, Goa.
- Gaur AC, Neblakantan S & Dargan KS. 1984 *Organic Manures*. ICAR.
- Lampkin N & Ipswich. 1990. *Organic Farming*. Farming Press. London.
- Lampkin NH & Padel S. 1992. *The Economics of Organic Farming - An International Perspective*. CABI.
- Palaniappan & Annadurai. 2008. *Organic Farming- Theory and Practise*. Scientific Publ.
- Peter KV. 2008. (Ed.). *Basics of Horticulture*. New India Publ. Agency. New Delhi.
- Rao S. 1977. *Soil Microorganism and Plant Growth*. Oxford & IBH.

*[Handwritten signatures and dates]*  
23/5/17  
23/5/17  
23/5/17

M.Sc Ag II Horticulture.  
Paper IV

(4)

**OPTIONALS** . POST HARVEST TECHNOLOGY FOR FRUIT CROPS 2+1

**Objective**

To facilitate deeper understanding on principles and practices of post-harvest management of fruit crops.

**Theory**

UNIT I

Maturity indices, harvesting practices for specific market requirements, influence of pre-harvest practices, enzymatic and textural changes, respiration, transpiration.

UNIT II

Physiology and biochemistry of fruit ripening, ethylene evolution and ethylene management, factors leading to post-harvest loss, pre-cooling.

UNIT III

Treatments prior to shipment, viz., chlorination, waxing, chemicals, biocontrol agents and natural plant products. Methods of storage-ventilated, refrigerated, MAS, CA storage, physical injuries and disorders.

UNIT IV

Packing methods and transport, principles and methods of preservation, food processing, canning, fruit juices, beverages, pickles, jam, jellies, candies.

UNIT V

Dried and dehydrated products, nutritionally enriched products, fermented fruit beverages, packaging technology, processing waste management, food safety standards.

**Practical**

Analyzing maturity stages of commercially important horticultural crops, improved packing and storage of important horticultural commodities, physiological loss in weight of fruits and vegetables, estimation of transpiration, respiration rate, ethylene release and study of vase life extension in cut flower using chemicals, estimation of quality characteristics in stored fruits and vegetables, cold chain management - visit to cold storage and CA storage units, visit to fruit and vegetable processing units, project preparation, evaluation of processed horticultural products.

**Suggested Readings**

- Bhutani RC. 2003. *Fruit and Vegetable Preservation*. Biotech Books.  
Chadha KL & Pareek OP. (Eds.). 1996 *Advances in Horticulture*. Vol. IV. Malhotra Publ. House.  
Haid NF & Salunkhe SK. 1997. *Post Harvest Physiology and Handling of Fruits and Vegetables*. Grenada Publ.  
Mitra SK. 1997. *Post Harvest Physiology and Storage of Tropical and Sub-tropical Fruits*. CABI.  
Ranganna S. 1997. *Hand Book of Analysis and Quality Control for Fruit and Vegetable Products*. Tata McGraw-Hill.  
Sudheer KP & Indira V. 2007. *Post Harvest Technology of Horticultural Crops*. New India Publ. Agency.  
Willis R, Mc Glassen WB, Graham D & Joyce D. 1998. *Post Harvest. An Introduction to the Physiology and Handling of Fruits, Vegetables and Ornamentals*. CABI.

Approved

28/05/17

28/05/17

28/05/17

28/05/17