



Evaluation Scheme & Syllabus
of

M.Sc. Ag. (Agronomy)

Course Curriculum

(w.e.f. Academic Session 2022-2023)

Department of Agriculture
INVERTIS UNIVERSITY- INVERTIS VILLAGE
Bareilly- Lucknow NH-24, Bareilly

Examination Scheme (Third Semester)

III Semester (Credit hours distribution)			
S.No	Course Code	Course Title	Credit Hours
1	MAGR-301	Agronomy of oilseed, fiber and sugar crops	3(2+1)
3	MAGR-302	Soil Biology and Biochemistry	3(2+1)
4	MAGR-303	Principles of Plant Physiology	3(2+1)
5	MAGR-304	Masters' Seminar	1(0+1) *
6	MAGR-460	Masters' Research	9(0+9) *
Total Credit			19 (6+3+10*)
-Non gradial , (6+3+10):-6 lectures, 13 practicals(4Main practicals+9 Non gradial practicals)			

Evaluation Scheme									
Course code	Course title	C	L	P	PM	UT	ESM	T	MP
MAGR-301	Agronomy of oilseed, fiber and sugar crops	3	2	1	20	30	50	100	10.0
MAGR-302	Soil Biology and Biochemistry	3	2	1	20	30	50	100	10.0
MAGR-303	Principles of Plant Physiology	3	2	1	20	30	50	100	10.0
MAGR-304	Masters' Seminar*	1	0	1	-	-	-	100	10.0
MAGR-460	Masters' Research*	9	0	9	-	-	-	-	S
C-Credit, L-Lecture, P-Practical, UT-Unit test, ESM: End semester marks, MP: Maximum Points, S: Satisfactory									

MAGR-301: AGRONOMY OF OILSEED, FIBRE AND SUGAR CROPS	
Teaching Scheme Lectures and Practical: 3 hr./ week (2+1) Tutorials: Nil Credits: 3	Examination Scheme Unit Test: 30Marks Practical marks: 20Marks End Semester Exam:50Marks

Course objective:

- 1.To teach the crop husbandry of oilseed, fiber and sugar crops.

Theory:

Origin and history, area and production, classification, improved varieties adaptability, climate, soil, water and cultural requirements, nutrition quality component, handling and processing of the produce for maximum production of:

UNIT II

Rabi oil seeds – Rapeseed and mustard, linseed, etc.

UNIT II

Kharif oil seeds - Groundnut, sesame, castor, sunflower, soybean etc.

UNIT III

Fiber crops - Cotton, jute, sun hemp etc.

UNIT IV

Sugar crops – Sugar-beet and sugarcane.

Practical:

1. Planning and layout of field experiments
- 2.Cutting of sugarcane setts, its treatment and methods of sowing, tying and propping of sugarcane
- 3.Determination of cane maturity and calculation on purity percentage, recovery percentage and sucrose content in cane juice phenological studies at different growth stages of crop.
4. Intercultural operations in different crops.
5. Cotton seed treatment.

6. Working out growth indices (LER, CGR, RGR, NAR, LAD) aggressivity, relative crowding coefficient, monetary yield advantage and ATER of prominent intercropping systems

7. Judging of physiological maturity in different crops and working out

harvest index

8. Working out cost of cultivation of different crops

9. Estimation of crop yield on the basis of yield attributes

Course objective:

Basic knowledge on production of oil seed, sugar and fibre crops.

MAGR-302: SOIL BIOLOGY AND BIOCHEMISTRY

Teaching Scheme	Examination Scheme
Lectures and Practical: 3 hr./ week (2+1)	Unit Test: 30Marks
Tutorials: Nil	Practical marks: 20Marks
Credits: 3	End Semester Exam:50Marks

Course objective:

1. To teach students the basics of soil biology and biochemistry, including biogeochemical cycles, plant growth promoting rhizobacteria, microbial interactions in soil and other soil activities.

Theory:**UNIT I**

Soil biota, soil microbial ecology, types of organisms in different soils; soil microbial biomass; microbial interactions; un-culturable soil biota.

UNIT II

Microbiology and biochemistry of root-soil interface; phyllo sphere; soil enzymes, origin, activities and importance; soil characteristics influencing growth and activity of microflora.

UNIT III

Microbial transformations of nitrogen, phosphorus, sulphur, iron and manganese in soil; biochemical composition and biodegradation of soil organic matter and crop residues, humus formation; cycles of important organic nutrients.

UNIT IV

Biodegradation of pesticides, organic wastes and their use for production of biogas and manures; biotic factors in soil development; microbial toxins in the soil.

UNIT V

Preparation and preservation of farmyard manure, animal manures, rural

and urban composts and vermicompost. Biofertilizers – definition, classification, specifications, method of production and role in crop production.

Practical:

1. Determination of soil microbial population
2. Soil microbial biomass
3. Elemental composition, fractionation of organic matter and functional groups

Course outcome:

Experience on the knowledge of soil microbes and their utility in research for solving field problem.

MAGR-303: PRINCIPALES OF PLANT PHYSIOLOGY	
Teaching Scheme Lectures and Practical: 3hr./ week (2+1) Tutorials: Nil Credits: 3	Examination Scheme Unit Test: 30Marks Practical marks: 20Marks End Semester Exam:50Marks

Teaching Scheme

Lectures and Practical: 3hr./ week (2+1)

Tutorials: Nil

Credits: 3

Examination Scheme

Unit Test: 30Marks

Practical marks: 20Marks

End Semester Exam:50Marks

Course Objectives:

1. To study about physiological processes in plants.
2. To study the Cell organelles and their physiological functions.
3. To study about the structure and physiological functions of cell.
4. To study the Soil and plant water relationship

Theory:**UNIT I**

Cell organelles and their physiological functions, structure and physiological functions of cell wall, cell inclusions; cell membrane structure and functions.

UNIT II

Soil and plant water relations, water and its role in plants, properties and functions of water in the cell water relations-cell water terminology, water potential of plant cells; Mechanism of water uptake by roots-transport in roots, aquaporins. Movement of water in plants – Mycorrhizal association on water uptake;

UNIT III

Water loss from plants-Energy balance -Solar energy input-energy dissipation at crop canopy level evapotranspiration transpiration –Driving force for transpiration, plant factors influencing transpiration rate. Stomata structure and function – mechanism of stomatal movement, anti-transparent.

UNIT IV

Physiology of water stress in plants: Influence of water stress at cell, organ, plant and canopy levels. Indices for assessment of drought resistance. The role of mineral nutrients in plant metabolism; Essential elements, classification based on function of elements in plants;

UNIT V

Physiological and metabolic functions of mineral elements, critical levels, deficiency symptoms, nutrient deficiency and toxicity; Foliar nutrition, Uptake of mineral elements in plants –Mechanisms of uptake-translocation of minerals in plants.

Practical:

- 1.To study structure of plant cells.

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- 2.To demonstrate the process of osmosis with varying solution concentration.
 - 3.To separate and study plant photosynthetic pigments by paper chromatography.
 - 4.To demonstrate the process of plasmolysis using onion cells.
 - 5.To compare the rate of transpiration between the upper and lower surfaces of a leaf.
 - 6.To study the rate of respiration in germinating seeds having different substances such as carbohydrates, fats and proteins.

Reference books:

1. Pessaraki M. Handbook of Plant and Crop Physiology. CRC Press. Selected reviews and articles from Periodicals and Journals
2. Taiz, L. & Zeiger, E. 2006. Plant Physiology. 4th Ed. Sinauer Associates.
3. Hopkins, W.G. &Huner, N.P.A. 2004. Introduction to Plant Physiology. John Wiley & Sons.
4. Salisbury, F.B. & Ross, C. 1992. Plant Physiology. 4th Ed. Wadsworth Publ.
5. Gardner FP, Pearce RB & Mitchell RL. 1988. Physiology of Crop Plants. Scientific Publ.

Course outcome:

After completing the course, students will be able to understand the stomatal physiology in detail and mechanism of water and nutrient movement inside the plants together with effect of water stress on different plants and adaptation of plants towards it.

