



ANDHRA KESARI UNIVERSITY ::ONGOLE

CURRICULAR FRAMEWORK **B.VOC. (Agriculture)**

FROM THE A.Y. 2025-26 batch (Major + Minor with CSP & VI Semester Internship)

1st Year - Semester I								
Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Core (Basics in crop production and crop protection)	I	3	2	5	3	1	4
2	Major – Core (Basics of Agricultural Sciences)	II	3	2	5	3	1	4
3	AECC - English	I	4	0	4	3	0	3
4	AECC - MIL (Telugu/Hindi/Sanskrit)	I	4	0	4	3	0	3
5	Skill Enhancement Course (SEC) Intro' to Artificial Intelligence	I	4	2 (Practice)	6	4	0	4
End of Semester I of 1st Year		5	18	6	24	16	2	18
1st Year - Semester II								
Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Core (Principals of Agronomy)	III	3	2	5	3	1	4
2	Major – Core (Introduction to Soil Science)	IV	3	2	5	3	1	4
5	English	II	4	0	4	3	0	3
6	MIL (Telugu/Hindi/Sanskrit)	II	4	0	4	3	0	3
7	Multidisciplinary Course (Introduction to Social work)	I	2	0	2	2	0	2
8	Skill Enhancement Course (SEC) Application of Artificial Intelligence (Discipline Specific)	II	4	2 (Practice)	6	4	0	4
9	Indian Knowledge System	I	2	0	2	0	0	0
10	Community Service Project (minimum of 80 hours with 1 Credit)							1
End of Semester II of 1st Year		7	22	6	28	18	3	21

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2nd Year - Semester III								
Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Core (Agronomy of field crops)	VI	3	2	5	3	1	4
2	Major – Core (Manures, fertilizers and soil fertility management)	VII	3	2	5	3	1	4
3	Major – Core (Introduction to Entomology)	VIII	3	2	5	3	1	4
4	Minor (Fundamentals of Genetics)	I	3	2	5	3	1	4
5	AECC (Creative Writing/Business Writing in English)	III	4	0	4	3	0	3
6	AECC (Creative Writing/Journalistic Writing in MIL - Telugu/Hindi/Sanskrit)	III	4	0	4	3	0	3
7	Multidisciplinary Course (Introduction to Public Administration)	II	2	0	2	2	0	2
8	Skill Enhancement Course (SEC) Design Thinking/Problem Solving / Others	III	2	0	2	2	0	2
End of Semester III of 2nd Year		8	24	8	32	22	4	26

2nd Year - Semester IV								
Sl. No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Core (Introduction to Pathology)	IX	3	2	5	3	1	4
2	Major – Core (Pests of Field crops and their Management)	X	3	2	5	3	1	4
3	Major – Core	XI	3	2	5	3	1	4

	(Diseases of field crops and their management)							
4	Minor (Horticulture)	II	3	2	5	3	1	4
5	Multidisciplinary Course (Introduction to Nanotechnology)	IV	2	0	2	2	0	2
6	Skill Enhancement Course (SEC) Design Thinking/Problem Solving / Others	IV	2	0	2	2	0	2
End of Semester IV of 2nd Year		6	16	8	24	16	4	20

3rd Year - Semester V								
Sl.No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major - Core(Principles of Plant Breeding)	V	3	2	5	3	1	4
2	Major – Elective (Fundamentals of Genetics)	XII	3	2	5	3	1	4
3	Major – Elective (Fundamentals of Crop Physiology)	XIII	3	2	5	3	1	4
4	Minor (Principles of Organic farming)	III	3	2	5	3	1	4
5	Minor (Production technology Of fruits and Vegetables)	IV	3	2	5	3	1	4
6	Environmental Education	I	2	0	2	2	0	2
End of Semester V of 3rd Year		6	17	10	27	17	5	22
3rd Year - Semester VI								
Sl.No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Elective (weed and Water mangement)	XIV	3	2	5	3	1	4
2	Major – Elective (Pests of Horticultural	XV	3	2	5	3	1	4

Sl.No	Category	Course No	No. of Hours		Total No. of Hours	No. of Credits		Total No. of Credits
			Theory	Practical		Theory	Practical	
1	Major – Core (Principles of Plant Biotechnology)	XII	3	2	5	3	1	4
2	Major – Core (Breeding of Field Crops)	XIII	3	2	5	3	1	4
3	Major – Core (Fundamentals of Rural Sociology and extension education)	XIV	3	2	5	3	1	4
4	Major – Elective (Principles of Organic farming)	V	3	2	5	3	1	4
5	Major – Elective (Production technology of fruits and vegetables)	VI	3	2	5	3	1	4
6	OOTC	I	2		2	2		2
7	IKS	I	2		2		Audit Course	
End of Semester VIII of 4th Year		7	19	10	29	17	5	22

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B. VOCATIONAL COURSE

AGRICULTURE (Honours)

2025-26 Admitted Batch

Batch 3 Year Semester- V

Coures 11: PRINCIPLES OF PLANT BREEDING

(CREDITS 3+1=4)

UNIT-I-

- Self – incompatibility and male sterility- genetic consequences, cultivar options; Domestication, Acclimatization, introduction, Centre of origin/diversity.

UNIT-II-

- Genetic basis and breeding methods in self-pollinated crops-mass and pure line selection, hybridization techniques and handling of segregating population.

UNIT-III-

- Multiline concept; Concepts of population genetics and Hardy Weinberg Law.
- Genetic basis and methods of breeding cross pollinated crops, modes of selection.

UNIT-IV-

- Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties
- Breeding methods in asexually propagated crops, clonal selection and hybridization.

UNIT-V

- Wide hybridization and pre-breeding; Polyploidy in relation to plant breeding; mutation breeding- methods and uses.

(PRACTICAL)

- Plant Breeder's kit; Study of germplasm of various crops;
- Study of floral structure of self-pollinated and cross pollinated crops;
- Emasculation and hybridization techniques in self & cross pollinated crops;
- Consequences of inbreeding on genetic structure of resulting populations;
- Study of male sterility system; Handling of segregation populations;
- Methods of calculating mean, range, variance, standard deviation.
- Designs used in plant breeding experiment, analysis of Randomized Block Design;
- Estimation of heterosis, inbreeding depression and heritability;
- Layout of field experiments;
- Work out the mode of pollination in a given crop and extent of natural out crossing;
- Prediction of performance of double cross hybrids.

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REFERENCES

1. Principles of Plant Breeding (1st & 2nd Edition) by RW Allard,
2. Breeding Field Crops by JM Poehlman,
3. Plant Breeding: Principles & Practices by JR Sharma,
4. Genetics by Strickberger, and
5. An introduction to genetic analysis by Suzuki et Al.

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Batch 3 Year Semester- V

Coures 12: FUNDAMENTALS OF GENETICS

(CREDITS 3+1=4)

UNIT – I

- Gene expression and differential gene activation – Operon concept – Lac Operon
- Meiosis – definition – process – differences between mitosis and meiosis – significance in plant breeding
- linkage – definition – linkage groups – characteristic features of linkage – pleiotropy – linkage groups
- Crossing over – mechanism of crossing over – types of crossing over – factors effecting crossing over – cytological proof of crossing over in Drosophila – significance of crossing over in plant breeding – coincidence – interference

UNIT – II

- Mendel's Laws – Law of segregation – Law of independent assortment – Principle of dominance – Principle of unit characters – exceptions to Mendel's Laws
- Monohybrid and dihybrid ratios – modifications of F₂ ratio in monohybrid and dihybrid crosses and lethal factors

UNIT - III

- Gene action – types of gene action – pleiotropism – alleles – characteristic features of alleles
- multiple alleles (blood groups in human beings) – characteristic features of multiple alleles –
- Penetrance (complete penetrance and incomplete penetrance) and expressivity (uniform expressivity and variable expressivity) – sex determination

UNIT – IV

- Gene mutations – introduction – definition – terminology – classification of mutations – characteristic features of mutations – spontaneous mutations and induced mutations
- Gene mutations – artificial induction of mutations – physical and chemical mutagens
- Chromosomal aberrations – structure – types of structural chromosomal aberrations – deletions (deficiencies) and duplications

UNIT - V

- Numerical chromosomal aberrations – terminology – classification – euploidy and aneuploidy – kinds of polyploids – autopolyploids, allopolyploids and segmental allopolyploids
- Numerical chromosomal aberrations – euploidy – monoploids – haploids – differences between monoploids and haploids – diploidy – polyploidy – origin of polyploidy – induction of polyploidy – triploids – tetraploids
- Numerical chromosomal aberrations – polyploidy
- Numerical chromosomal aberrations – aneuploidy – types of aneuploids – monosomics, double monosomics, nullisomics, double nullisomics, trisomics (primary, secondary and tertiary trisomics) and tetrasomics

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References

1. Gupta, P.K. 1985. Cytology, Genetics and Cytogenetics. Rastogi Publications, Meerut.
- Gupta, P.K. 2007. Genetics. Rastogi Publications, Meerut.
2. Pundhan Singh, 2000. Elements of Genetics. Kalyani Publishers, Ludhiana.
3. Singh, B.D. 2007. Fundamentals of Genetics. Kalyani Publishers, Ludhiana.
4. Strickberger, M.W. 2004. Genetics. Prentice – Hall of India Pvt. Ltd., New Delhi.
5. Verma, P.S. and Agarwal, V.K. 2005. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand and Co., New Delhi

FUNDAMENTALS OF GENETICS (PRACTICAL)

1. Study of microscope.
2. Study of cell structure.
3. Practice on mitotic cell division.
4. Practice on meiotic cell division.
5. Practice on meiotic cell division.
6. Probability and Chi-square test.
7. Monohybrid and its modifications.
8. Dihybrid.

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AGRICULTURE (Honours)

2025-26 Admitted Batch

Batch 3 Year Semester- V

Coures 13: FUNDAMENTALS OF CROP PHYSIOLOGY (CREDITS 3+1=4)

UNIT – I

Absorption of water – Diffusion and osmosis – water potential and its components – Importance of water potential – Active and passive uptake of water – Stomatal complex – Transpiration – Water use efficiency – Water use efficiency of C₃, C₄ and CAM plants – Water requirement / Transpiration ratio- Factors affecting WUE. Assimilation of mineral nutrients – Nitrate assimilation – Ammonium assimilation in plants – Biological nitrogen fixation – Free-living and symbiotic bacteria – Nodule formation – Nitrogenase enzyme complex.

UNIT – II

Photosynthesis – Reactions of photosynthesis – Energy synthesis – Principle of light absorption by plants – Light reactions – Cyclic and non-cyclic photophosphorylation – CO₂ fixation – C₃ and C₄ pathways – Significance of C₄ pathway – CAM pathway and its significance

UNIT – III

Photorespiration and its significance – Photosynthetic efficiency of C₃, C₄ and CAM plants – Factors affecting photosynthesis (light, CO₂, temperature and water stress). Respiration – Energy balance – Significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP) and its significance.

UNIT – IV

Physiology of flowering – Photoperiodism and flowering – Importance of photoperiodism – Classification of plants based on photoperiodic responses – Flowering hormones – Vernalization and flowering – importance of vernalization in AGRICULTURE (Honours). Plant growth regulators – Auxins – mode of action and physiological roles – Commercial uses – Gibberellins – mode of action and physiological roles – Commercial uses – Cytokinins – mode of action and physiological roles – commercial uses – ABA – mode of action and physiological roles Commercial uses – Ethylene – mode of action and physiological roles – Commercial uses.

UNIT – V

Post-harvest physiology – Dormancy – Types of dormancy – Advantages and disadvantages of dormancy – Fruit ripening – Climacteric and non-climacteric fruits – Metabolic changes during fruit ripening – Hormonal regulation of fruit ripening – Ripening induction and ripening inhibition – Seed viability and seed vigor – Tests of viability and vigor- Physiological maturity, harvestable maturity- Indices of physiological maturity in crops.

FUNDAMENTALS OF CROP PHYSIOLOGY (PRACTICAL)

Solutions- Preparation, Seed vigor and viability tests, optimum conditions for seed germination, leaf area measurement, Growth analysis, Measurement of water status in plants, Measurement of water potential, Measurement of Stomatal frequency and index photosynthetic pigments- Absorption spectrum, Leaf anatomy of C₃ and C₄ plants, Measurement of photosynthesis – Hill's reaction, Measurement of photosynthesis by IRGA, Effect of plant growth regulators on plant growth. Diagnosis of various nutrient deficiency symptoms in various Field and Horticultural crops, their Yield analysis.

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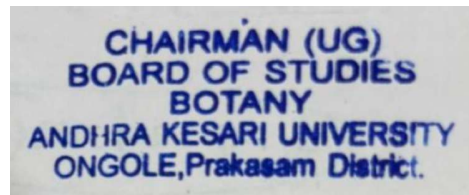
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References

Taiz, L. and Zeiger, E. 2010. *Plant Physiology* 5th edition, Sinauer Associates, Sunderland, MA, USA.

Gardner, F.P., Pearce, R.B., and Mitchell, R.L. 1985. *Physiology of Crop Plants*. Scientific Publishers, Jodhpur.

Noggle, G.R. and Fritz, G.J., 1983. *Introductory Plant Physiology*. 2nd Edition. Prentice Hall Publishers, New Jersey, USA.

A handwritten signature in green ink, appearing to read 'A. Ramane', is written above a rectangular stamp.



ANDHRA KESARI UNIVERSITY

B. VOCATIONAL COURSE

AGRICULTURE (Honours)

2025-26 Admitted Batch

Batch 3 Year Semester-VI

Course 14: Weed and Water Management

(Credits-3+1=4)

UNIT-I

- Weed Biology and Ecology Weeds: Introduction, Definitions; harmful and beneficial effects, classification, propagation, dissemination and weed seed dormancy; Weed biology and ecology; Critical periods of crop weed competition and allelopathy. Principles of Weed Management Concepts of weed prevention, control and eradication; Methods of weed management: cultural, mechanical, chemical, biological and; Integrated weed management.

UNIT-II

- Herbicides: Definition – advantages and limitation of herbicide usage in India; Herbicide classification, formulations, methods of application; Introduction to Adjuvants. Weed management in field crops; aquatic, problematic, invasive alien weeds.

UNIT-III

- Importance and History of Irrigation: Role of water in plant growth – Importance of irrigation – Water resources and irrigation potential of India – History and development of irrigation in India – Soil – water– plant relationship – Soil Plant Atmospheric Continuum (SPAC) – Hydrological cycle – Absorption of water – Evapotranspiration – Plant water stress and its effect and methods to overcome stress.

UNIT-IV

- Crop Water Requirement and Management: Crop water requirement – consumptive use – Definition and estimation – Factors affecting water requirement – Effective rainfall – Critical stages for irrigation – Water requirement of crops – Water management for major field crops.

UNIT-V

- Scheduling of irrigation – Different approaches – Water use efficiency – Methods to improve WUE – Conjunctive use of surface and ground water. Quality of irrigation water – Agronomic practices for use of poor quality water (saline, effluent and sewage water) for irrigation.

References

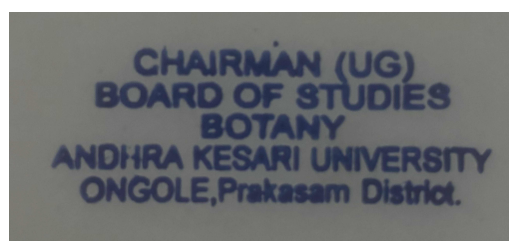
1. Principles and practices of modern weed management by o.p. gupta
2. Principles and practices of weed management by t.k.das
3. Sharma, R.K. and Sharma, T.K. 1993. Irrigation and Drainage. Vol-I. Oxford IBH publishing Co.PVT.Ltd, New Delhi.

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WEED AND WATER MANAGEMENT (PRACTICAL)

1. Identification, classification and characterization of terrestrial weeds.
2. Identification, classification and characterization of aquatic weeds and parasitic weeds.
3. Estimation of soil weed seed bank.
4. Identification, classification and characterization of herbicides.
5. Herbicide application techniques and spray equipment.
6. Land leveling and land shaping – Beds and channels – check basin – ridges and furrows-
border strips – broad bed furrow method of irrigation.
7. Operation and maintenance of sprinkler irrigation systems and drip irrigation systems.
8. Scheduling of irrigation based on simple techniques and devices.
9. Weed herbarium collection.



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2025-26 Admitted Batch

Batch 3 Year Semester-VI

Course 15: Pests of Horticultural crops and Productive entomology (Credits-3+1=4)

UNIT I

- Importance and history of sericulture – organizations involved in sericulture – silkworm types- mulberry cultivation – varieties – morphology of mulberry plant – methods of propagation – nursery and main field preparation – planting methods – identification of nutrient deficiency symptoms – identification of weeds – herbicide application methods – irrigation methods and management practices

UNIT II

- Rearing house – types – disinfection – room and bed disinfectants – egg incubation methods- chawki rearing- rearing of late age worms – spinning – Mounting mountages – harvesting- Physical and Commercial Characteristics of Cocoons. Defective Cocoons- Pests and diseases of silkworm and their management – post cocoon technology – stifling. By products of sericulture – non –mulberry silkworm

UNIT III

- Apiculture – Bee species – comparison- castes of bees, Morphology and Biology; Apiary management practices – bee pasturage, foraging, bee behavior and bee dance, seasonal variations; Honey Extraction, Bee products, properties and uses; Lac insect- Biology, Behaviour, Host Plants and strains – Inoculation, Harvesting and Processing; natural enemies of lac insect and lac products

UNIT IV

- Pests of vegetable crops and plantation crops – Distribution, bionomics, symptoms of damage and management strategies for insect, pest and integrated management of solanaceous, cucurbits, crucifers, root crops, coconut, cashew nut and bhendi

UNIT V

- Pests of fruit crops – Distribution, bionomics, symptoms of damage and management strategies for insect, pest and integrated management of mango, citrus, banana, guava, pomegranate, apple

PRACTICAL:

1. Identification of Insect Pests, Diseases and Nutrient deficiencies in Mulberry Garden.
2. Rearing house and appliances of Silk worm.
3. Pests and Diseases of Silk Worm.
4. Silk worm Cocoons- Mounting, Harvesting and Stifling.
5. Honey bee- Types of Bee Hives, Bee Rearing Equipment and Honey Extraction.
6. Insect Pests, Predators and Diseases of Honey Bee.
7. Lac- Inoculation, Harvesting and Processing.
8. Identification of Pests on Solanaceous Vegetable Crops and Bhendi.
9. Identification of Pests on Cruciferous and Cucurbit Vegetable crops.
10. Identification of Pests on Fruit Crops- mango, citrus, banana, guava. Xii. Identification of Pests on Fruit Crops- sapota, papaya, pomegranate, app

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REFERENCES

1. Vasanthraj David. B and Rama murthy VV 2016 Elements of Economic Entomology, popular book depot, Coimbatore
2. Vasanthraj David. B and Ananthakrishnan T.N.2016. General and applied Entomology , Tata McGraw-Hill publishing house, New Delhi.
3. Nair MRGK 1986, Insects and Mites of Crops in India, ICAR, New Delhi.
4. 4. Khare, S.P 1993 Stored Grain Pests and their Management, kalyani publishers, Ludhina



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