

**IDEAL COLLEGE OF ARTS AND SCIENCES**  
(A.P. GOVT., AIDED, AUTONOMOUS & NAAC B)  
**DR. P.V.N. RAJU VIDYAPRANGANAM**  
**KAKINADA**



**BOARD OF STUDIES**  
**2021-2022**

**COURSE: B.VOC., AGRICULTURE**

SEMESTERS(I,II,III,IV)

**DEPARTMENT OF AGRICULTURE**

**IDEAL COLLEGE OF ARTS AND SCIENCES  
(A.P. GOVT., AIDED, AUTONOMOUS & NAAC B)  
DR. P.V.N. RAJU VIDYAPRANGANAM  
KAKINADA**

Date: 20.12.2022

**Board of Studies of B.Voc. Agriculture**

A meeting of Board of studies of the Department of agriculture will be held on 20.12.2022 at 2 P.M in Ideal College of Arts and Sciences (Autonomous), Vidyutnagar, Kakinada, to consider the following Agenda.

You are cordially invited to attend the meeting and make it a success.






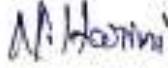

**Agenda:**

1. To ratify the syllabus for the First year & Second year (I, II, III & IV Semesters).
2. To prepare and ratify scheme of Examinations for both internal and external examinations.
3. Model Question paper for First year & Second year).
4. To fix Panel of paper setters and Examiners.
5. Additional inputs into the curriculum and up gradation of syllabus incorporate the Apprenticeship.
6. Other academic activities of Department.

*T. Sankararam*  
PRINCIPAL

**IDEAL COLLEGE OF ARTS AND SCIENCES**  
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**KAKINADA**

The syllabus of model question paper of Agriculture subject from B. Voc Agriculture course for the first and second year of Academic year 2021-22, list of examiners and paper setters, department activities is approved in the board of studies meeting held in department of Agriculture 2pm.

Sl. No	Members present		Signature
1.	B. Surendra Sagar	Chairman	
2.	Ch. Jogi Raju	University Nominee	
3.	S. Emmanuel	Subject expert	
4.	Pavithra Bathina	Faculty member	
5.	Ch. Subramanyam	Industry Person	
6.	N. Harinika manimala	Student Member	
7.	Y. Kusa Raju	Student Member	

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VIDYAPRANGANAM KAKINADA  
DEPARTMENT OF AGRICULTURE  
**Board of Studies of B.VOC., AGRICULTURE RESOLUTIONS**

Resolved to follow the following pattern for examinations

1. Each paper has 30 marks (30%) of internal (Continuous Assessment) (15+10+5 \*) and 70 marks (70% of external semester- end examination).
2. During each semester two internal examinations will be conducted as per schedule for each paper.
3. The average of two internal examination marks conducted by college is considered as internal examination marks.
4. No minimum pass marks for internal examination
5. In each semester, the student has to possess a minimum attendance of 75%.
6. Students having attendance between 65% and 75% may be permitted to appear in Semester End/Annual examination on medical grounds only, on payment of Condo nationfee along with medical certificate from Government Medical Officer.
7. If a student is detained due to shortage of attendance i.e. less than 65%, he has to re-join the semester with prior permission from the university. Such students are not eligible to take subsequent semester.
8. If the student is absent for internal examination then his/her internal marks are recorded as zero marks
9. No separate internal examination is conducted for absentees
10. The minimum pass mark for external examination is 25 marks out of 70 marks in external semester end examination
11. However, the student should secure minimum of 40 marks out of 100 marks in internal and external examinations put together.
12. Practical examination will be conducted at the end of every semester of academic year
13. Resolved to approve upgradation in the Syllabus I & II Semesters
14. Resolved to Approve Departmental activities for the year 2020-2021
15. Follow the language papers, Life Skill Courses, Skill Development Courses and major (1&2) core papers (1&2) as per autonomous rules/University norms.
16. Resolved to authorize the Chairman, Board of studies to take up all the necessary steps for utilization of the syllabi to be implemented from the academic year 2020-2021 and also is authorized to adopt any changes made in the middle of the academic year if any
17. Resolved to approve the certificate courses on **Organic Farming & Hydroponics** in semester –I and semester –V for BA, B.com, Bsc & Bvoc students.
18. Resolved to approve action plan for the year of 2021-22
19. Resolved to approve the departmental activities for the year of 2021-22
20. Resolved to authorize the chairman board of studies to take up all the necessary for the utilization of syllabi to be implemented from the academic year 2021-22 and also authorize to adopt any changes in the middle of the academic year by the university APSCHE and other exigencies in consultation with the controller to examinations if necessary

\* Indicates the marks allotted for student activities like attendance, participation in PPTs, Paper presentation, Seminar, Quiz, Group Discussion and Assignments

*T. Sahithyane*  
PRINCIPAL

IDEAL COLLEGE OF ARTS AND SCIENCES  
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P.V.N. RAJU VIDYAPRANGANAM, KAKINADA

Bachelor of Vocation: Agriculture

**Course structure and syllabi: w.e from 2021-22 Admitted Batch  
Semester –I**

S.No	Name of the Subject	Total Marks	Mid. Sem Exam	Sem.End Exam	Teaching Hours	Credits
1	English	100	30	70	4	3
2	Telugu	100	30	70	4	3
3	Basic computer application (LS)	50	-- -	50	2	2
4	Electrical appliances (SD)	50	---	50	2	2
5	Chemistry (Inorganic and Physical chemistry)	100	30	70	4	4
6	Chemistry (Practical- Analysis of salt mixture )	50	30	50	2	1
7	Introduction to Agronomy	100	30	70	4	4
8	Introduction to Agronomy Practical	50		70	2	1
9	Introduction to soil science	100	30	70	4	4
10	Introduction to soil science practical	50	---	50	2	1
11	Principles of plant breeding	100	30	70	4	4
12	On Job Training	50	---	50	2	1
		900	180	720	36	29

**Bachelor of Vocation: AGRICULTURE**  
**2020-21 Admitted Batch**  
**I Year; Semester – I INTRODUCTION TO AGRONOMY**

**CREDITS: 4**

**Teaching Hours: 4**

**Theory: Learning Outcome:**

On successful completion of this course, the student will be able to

- Understand basic principles of Agronomy
- Understand the methods of preparing soil ready for raising a crop
- Understand the soil, water and plant relationships
- Understands the water and nutrient use efficiency, Irrigation and manuring
- Understand the weed competition, concepts of weed management
- Understand the growth and development of the crops, crop rotation and crop management techniques in problem soils

**COURSE OUTLINES –SYLLUBUS OF THE COURSE**

**UNIT- I:** Importance and scope

Agriculture - Definition

Branches of agriculture

History of agricultural development in the World and India.

**UNIT - II:** Agro climatic zones

Agronomy - Definition - Importance - Meaning and scope Agro-climatic zones of Andhra Pradesh & India- Crops and their classification- Factors affecting crop production

**UNIT - III:** Tillage

Types - Objectives - Modern concepts of tillage  
Crop establishment methods

**UNIT – IV:** Manures and fertilizers

Irrigation management - types  
Fertilizer application - methods

**UNIT – V:** Cropping patterns and cropping systems

Weed management- harmful and beneficial effects of weeds- weed control methods  
Sustainable agriculture  
Integrated farming systems  
Organic agriculture

**Bachelor of Vocation: AGRICULTURE**

**2020-21 Admitted Batch  
I Year Semester – I**

**INTRODUCTION TO AGRONOMY  
(PRACTICAL)**

**CREDITS: 1**

**Teaching hours: 2**

**PRACTICAL SYLLABUS**

1. Visit to college farm & Study of farm features and measurements
2. Identification of crops and seeds
3. Study of seed treatment practice
4. Study of tillage implements- practicing ploughing, puddling operations
5. Calculation of the seed rate and fertilized requirements.
6. Different methods of seed sowing and planting.
7. Methods of inter – cultivation operations and implements
8. Fertilizer applications and participation in field operations.

Reference Books

Reddy , S R and Reddi Ramu 5th edition 2016, -Kalyani publishers, Ludhiana.

YELLAMANDA REDDY,T. and SANKARA REDDY ,G.H.(2016) PRINCIPLES OF AGRONOMY. Kalyani publishers, Ludhiana

GOPALA CHANDRA DE.(1989) FUNDAMENTALS OF AGRONOMY. Oxford & IBH Publishing Company Pvt Ltd , New Delhi

GUPTA, O. P. (2011) MODERN WEED MANAGEMENT. Agribios (India) Jodhpur.

**Bachelor of Vocation: AGRICULTURE**

**2020-2021 Admitted Batch onwards  
I Year Semester – I**

**INTRODUCTION TO SOIL SCIENCE**

**CREDITS: 4**

**Teaching Hours: 4**

**Theory: Learning Outcome:**

**On successful completion of this course, the student will be able to**

- **Understand basic principles of Soil science**
- **Understand the soil formation, soil profile, and soil physical properties**
- **Understand the elementary knowledge of soil taxonomy**
- **Understands the problematic soils and their management**
- **Understand soil organic matter composition and its influence on soil micro organisms**

**COURSE OUTLINES –SYLLUBUS OF THE COURSE**

**UNIT - I.INTRODUCTION:**

Definition of soil  
Soil as a Natural Body

**UNIT - II.SOIL COMPONENTS:**

Soil air  
Soil water  
organic and inorganic solids

**UNIT - III.PHYSICAL PROPERTIES:**

Soil separates, texture, Aggregation and Structural Characters, Temperature, Colour.  
Properties of Soil Mixture, Pore Space, Bulk Density, Particle Density, Aeration.  
Drainage, compaction, Surface area, Soil water relations.

**UNIT - IV. MORPHOLOGY OF COLLOIDS & BIOLOGICAL PROPERTIES OF SOIL**

Chemistry of clays, Ionic exchange  
Acidity, alkalinity, PH, and salinity relations, Liming and Acidification.  
Soil Organic matter, C:N relations  
N Transformations, Soil organisms, Sulphur transformation.

**UNIT - V. GENESIS AND CLASSIFICATION**

Profile, Soil forming factors  
Soil Survey methods  
5.3 Soil survey Reports  
5.4 Soil distribution, Classification of Systems, Drainage, Erosion: Mechanisms -Control.



**Bachelor of Vocation: AGRICULTURE**  
**2020-21 Admitted Batch**  
**I Year Semester – I**

**INTRODUCTION TO SOIL SCIENCE**  
**(PRACTICALS)**

**Teaching Hours:2**

**Credits:1**

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**PRACTICAL SYLLABUS**

1. Soil sampling procedures for field and horticultural crops
2. Determination of EC.
  
3. Determination of PH of soil.
  
4. Land use, texture bulk density, Definition of Soil Physical properties.
  
5. Determination of N, P and K of the soil
  
6. Determination of Sulphur.
  
7. Fertilizer recommendations.
  
8. Soil health card, parameters, EC, PH and their Importance

**References**

1. Indian Society of Soil Science.2012. Fundamentals of Soil Science. IARI, New Delhi
2. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilizers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005.
4. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillan Publishing Co., New York.
5. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

## **Bachelor of Vocation: AGRICULTURE**

**2020-21 Admitted Batch**

**I Year Semester – I**

### **PRINCIPLES OF PLANT BREEDING**

**Credits -4**

**Teaching Hours :4**

#### **Learning Out Comes: Theory**

- The students should understand what is Plant breeding –its important in increasing the production, Productivity, Quality, resistance to biotic and abiotic stresses etc
- Understand the different special breeding methods of improvement in both self- and cross-pollinated crops
- The students should understand, acquaint and practice with the breeder's kit and its contents
- The students should have enough practice in emasculation, pollination and production of new hybrids in both self, cross pollinated crops and asexually propagated plants
- The students should have been the experts in selection of superior plants and progenies from the segregating generations
- The students should have well acquainted with statistical procedures to evaluate different varieties, populations and segregating generations

#### **Lecture outlines Theory**

##### **UNIT 1**

1. 1 Plant Breeding - Definition, aim, objectives, history and developments of plant breeding, - Landmarks in plant breeding - Scope of plant breeding.
2. Modes of reproduction and apomixes - Asexual reproduction (vegetative reproduction and apomixis) and sexual reproduction - Their classification and significance in plant breeding.
3. Modes of pollination - Classification of crop species on the basis of mode of pollination– self pollination – mechanisms promoting self pollination – Genetic consequences of self pollination – Cross pollination – Mechanisms promoting cross pollination – Genetic consequences of cross pollination – Often cross pollinated crops.
4. Self– incompatibility - Classification – Heteromorphic, homomorphic, gametophytic and sporophytic systems of incompatibility – Advantages and disadvantages – Utilization in crop improvement.
5. Male sterility- Genetic consequences, cultivar options - Different types – Genetic, cytoplasmic and cytoplasmic genetic male sterility – Inheritance and maintenance–utilization of male sterile lines in hybrid seed production – Their advantages and disadvantages.

##### **UNIT 2**

1. Germplasm collections – Genetic erosion – Main reasons of genetic erosion – Extinction - Gene sanctuaries - Gene banks – Types of gene banks.
2. Breeding methods in self pollinated crops - Modes of selection - Selection – Natural and artificial selection, heritability (narrow and broad sense) – Genetic advance as per cent of mean.
3. Mass selection – Procedure for evolving a variety by mass selection – Modification of mass selection – Merits, demerits and achievements.
4. Pure line selection - Johannsen's pure line theory and its concepts and significance – Origin of variation in pure lines – Characters of pure lines – Progeny test, genetic basis of pure line selection – General procedure for evolving a variety by pure line selection – Merits, demerits and achievements – Comparison between mass and pure line selection.

### **UNIT 3**

1. Hybridization techniques - Hybridization – Aims and objectives – Types of hybridization – Pre- for hybridization – Procedure / steps involved in hybridization.
2. Pedigree method – Procedure – Merits, demerits and achievements. Bulk method – Procedure – Merits, demerits and achievements – Comparison between pedigree and bulk methods - Single seed descent method – Merits and demerits.
3. Backcross method of breeding–Its requirements and applications – Procedure for transfer of single dominant gene - Procedure for transfer of single recessive gene – Merits, demerits and achievements - comparison between pedigree and backcross method.
4. Recurrent selection – Different types – Detailed procedure of simple recurrent selection and other recurrent selection methods – Conclusion on the efficiency of different selection schemes.

### **UNIT 4**

1. Heterosis - Heterosis and hybrid vigour – Luxuriance – Heterobeltiosis – heterosis in cross pollinated and self pollinated species – Manifestations of heterosis-Genetic basis of heterosis – Dominance, over dominance and epistasis hypotheses – Objections and their explanations – Comparison between dominance and overdominance hypotheses – Physiological basis of heterosis – Commercial utilization.
2. Inbreeding depression - Brief history – Effects of inbreeding – Development of inbred lines and hybrids– History of hybrid varieties – Important steps in production of single and double cross hybrids .
3. Composite and synthetic varieties - Production procedures – Merits, demerits and achievements – Factors determining the performance of synthetic varieties – Comparison between synthetics and composites.

### **UNIT 5**

1. Mutation breeding - Methods and uses - Mutation breeding – Procedure of mutation breeding – Applications – Advantages, limitations and achievements.
2. Breeding for important biotic and abiotic stresses
3. Polyploidy in relation to plant breeding - Polyploidy – Auto polyploids – Origin and production – Morphological and cytological features– Applications in crop improvement – Limitations– Allo polyploidy – Morphological and cytological features– Applications in crop improvement – Limitations.

### **Reference Books**

B.D .Singh. Principles Of Plant Breeding. Kalyani Publication. New Delhi.

**B.VOC: Agriculture**  
**Semester-I,**  
**2020-2021**  
**OJT (ON JOB TRAINING)**

**Teaching Hours:2**

**Credits:1**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING & SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

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**Bachelor of Vocation: Agriculture**  
**Course structure and syllabi: w.e from 2021-22 Admitted Batch**  
**Semester –II**

S.No	Name of the Subject	Total Marks	Mid. Sem Exam	Sem.End Exam	Teaching Hours	Credits
1	English	100	30	70	4	3
2	Telugu	100	30	70	4	3
3	Information & Communication Technology (LSC)	50	---	50	2	2
4	Solar Energy (SD-1)	50	---	50	2	2
5	Advertising (SD-2)	50				
6	Chemistry(Organic and general chemistry)	100	30	70	4	4
7	Chemistry (Practical – II volumetric analysis)	50		50	2	1
8	Introduction to Entomology	100	30	70	4	4
9	Introduction to Entomology practical	50		50	2	1
10	Introduction to plant pathology	100	30	70	4	4
11	Introduction to plant pathology practical	50	---	50	2	1
12	Fundamentals of crop physiology	100	30	70	4	4
13	On Job Training	50	---	50	2	1
		900	180	720	36	30

**Bachelor of Vocation: AGRICULTURE**  
**2020-21 Admitted Batch**  
**I Year Semester – II**

**INTRODUCTION TO ENTOMOLOGY**

**THEORY - Credits: 4**

**Teaching Hours:4**

**Learning Out Comes:**

After completion of this course the students are able to

1. Understand Insect classification to some extent by taking phylum Arthropoda as an example
2. Understand basics of insect taxonomy and their arrangement
3. Understand basics insect ecology, factors effecting insect ecology such as biotic, abiotic and environmental
4. Understand basic concepts of pest forecasting
5. Understand basics of IPM-different aspects of IPM which is an important concept.

**Unit I: History and importance**

History of Entomology in India; Position of insects in the animal kingdom and their relationship with other classes of Arthropoda; Reasons for insect dominance.

**Unit II: Morphology**

General organization of insect body wall - structure and function, cuticular appendages, molting; Body regions - insect head, thorax and abdomen, their structure and appendages.

**Unit III: Anatomy and physiology**

Digestive, excretory, respiratory, circulatory, nervous and reproductive systems in insects in brief.

**Unit IV: Taxonomy of Apterygota and Exopterygota**

Insect systematics; distinguishing characters of agriculturally important orders and families of Hexapoda. Characters of Apterygota, Exopterygota (Ephemeroptera, Odonata, Orthoptera, Phasmida, Dictyoptera, Embioptera, Dermaptera, Hemiptera, Isoptera, Psocoptera, Mallophaga, Thysanoptera and Siphunculata).

**Unit V: Taxonomy of Endopterygota** Distinguishing characters of agriculturally important families of Lepidoptera, Coleoptera, Diptera, Hymenoptera, Siphonaptera, Neuroptera and Strepsiptera.

**Bachelor of Vocation: AGRICULTURE**  
**2020-21 Admitted Batch**  
**I Year Semester – II**

**INTRODUCTION TO ENTOMOLOGY**  
**PRACTICAL**

**Credits: 1**

**Teaching Hours:2**

- a. Observations on external features of grasshopper / cockroach,
- b. Methods of insect collection, preservation – Preparation of Riker mount.
- c. Types of insect head, antenna, mouth parts – Structure of thorax.
- d. Types of insect legs, wings and their modifications – wing coupling.
- e. Structure of abdomen, and its modifications.
- f. Metamorphosis in insects – immature stages in insects.
- g. Study of digestive and reproductive systems of grasshopper / cockroach –
- h. Observing the characters of agriculturally important orders and families.

**REFERENCES:**

1. Vasantharaj David, B. and Rama Murthy V.V. 2016. Elements of Economic Entomology, Popular Book Depot, Coimbatore.
2. Vasantharaj David, B and Aanathakrishnan, T.N. 2006. General and Applied Entomology. Tata McGraw-Hill Publishing House, New Delhi.
3. Metcalf, R.L. and Luckman, W.H. 1982. Introduction to Insect Pest Management. Wiley Inter Science Publishing, New York.
4. Atwal, A. S. and Bains, S.S. 1989. Applied Animal Ecology. Kalyani Publishers, New Delhi
5. Yazdani, S.S. and Agarwal, M.L. 1979. Elements of Insect Ecology. Narosa Publishing House, New Delhi.
6. Dhaliwal, G.S. and Ramesh Arora 2001. Integrated Pest Management: Concepts and Approaches, Kalyani Publishers Ludhiana
7. Gautam, R. D. 2008. Biological Pest Suppression. Westville publishing House New Delhi
8. Larry P Pedigo and Marlin E Rice. 2009. Entomology and Pest Management. Prentice Hall of India Private Ltd., New Delh

**Bachelor of Vocation: AGRICULTURE 2020-21**  
**Admitted Batch**  
**I Year Semester – II**

**INTRODUCTION TO PLANT PATHOLOGY**

**Credits: 4**

**Teaching Hours:4**

**Learning Out Comes:**

After completion of the course the students are able to

1. understand the importance of plant diseases, scope and objectives of plant pathology
2. understand the importance of disease-causing organisms, economic loss to the crop and economic threshold limits (ETL)
3. understand the basic aspects of pathogen morphology, propagation methods
4. understand the identification of diseases and casual organisms based on the symptoms

**UNIT 1:** Introduction to plant diseases and their causal organisms History, Importance of plant diseases, scope and objectives of Plant Pathology. Important plant pathogenic organisms, Classification of Plant Diseases Binomial system of nomenclature, rules of nomenclature

**UNIT 2 :** Fungi

- 2.1 Fungi: General characters, definition of fungus, somatic structures,
- 2.2 Types of fungal thalli, fungal tissues, modifications of thallus,
- 2.3 Reproduction (asexual and sexual)

**UNIT 3 :**

1. Bacteria and Mollicutes    Bacteria – General Characters, Classification of plant pathogenic bacteria
2. Important plant bacterial diseases and their causal agents
3. Mollicutes :Phytoplasm and Spiroplasma – General characters and important Diseases and vectors

**UNIT4 :** Plant Viruses

Fastidious vascular Bacteria – general characters and important diseases and vectors  
Viruses: General characters of plant viruses, nature, architecture

Symptoms of various viral diseases, transmission of plant viruses.

Important plant viral diseases and their vectors.

**UNIT 5:** Viroids, phanerogamic plant parasites and plant parasitic nematodes. Viroids – General characters and important diseases

Phanerogamic plant parasites – general characters, propagation, survival and their hosts Plant parasitic nematodes–general characters and important plant parasitic nematodes.



**Bachelor of Vocation: AGRICULTURE 2020-21**  
**Admitted Batch**  
**I Year Semester – II**  
**INTRODUCTION TO PLANT PATHOLOGY**  
**(PRACTICALS)**

**Teaching Hours:2**

**Credits: 1**

**PRACTICALS:**

1. Study of lab equipments.
2. Preparation of PDA (Potato Dextrose Agar).
3. Preparation of NA (Nutrient Agar).
4. General study of different structures of fungi.
5. Study of symptoms of various plant diseases.
6. Staining and identification of plant pathogenic bacteria.
7. Study of phanerogamic parasites.
8. 30 Herbarium of plant diseases caused by fungi, bacteria and viruses.

**References:**

1. Agribios, G.N. 2005. Plant Pathology. Elsevier Academic Press, New York.
2. Chaube, H.S. and Ramji Singh. 2001. Introductory Plant Pathology. International Book Distribution Co., Lucknow. 136
3. Mehrotra, R.S. 1980. Plant Pathology. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
4. Singh, R.S. 2002. Introduction to Principles of Plant Pathology. Oxford & IBH Publ. Co. Pvt. Ltd., New Delhi.
5. Vidyasekharan, P. 1993. Principles of Plant Pathology. CBS Publishers and Distributors, New Delhi.

**Bachelor of Vocation: AGRICULTURE 2020-2021**  
**Admitted Batch onwards**  
**I Year Semester – II**

**FUNDAMENTALS OF CROP PHYSIOLOGY**

**THEORY Credits: 4**

**Teaching Hours: 4**

**Learning outcomes:**

Crop physiology is a very important subject that reveals the various aspects of growth of the plants and its dynamics. After completion of this course the student learns to understand

1. the process of germination, different phases of germination of the seed and plantlet growth
2. water absorption and distribution to various parts of the plant, transpiration and evaporation
3. Nutritional intake, effects of various important nutrients and their deficiency symptoms nutrient uptake mechanisms; assimilation of mineral nutrients: nitrate, ammonium,
4. Able to identify deficiency of nutrients based on symptoms and behavior of plants
5. The seed dormancy, types, methods to overcome the same

**Lecture outlines**

**UNIT 1**

1. Introduction to Crop Physiology and its importance in Agriculture.
2. Metabolic changes during seed development - Physiological maturity, harvestable maturity - Indices of physiological maturity in crops - Seed germination - Metabolic changes during seed germination.
3. Growth and Development - Definition - Growth analysis - Growth parameters - Definitions and mathematical formulae
4. 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 of C3, C4 and CAM plants –

**UNIT 2**

1. Photosynthesis – Reactions of photosynthesis – Energy synthesis – Principle of light absorption by plants – Light reactions - Cyclic and non cyclic photophosphorylation – CO<sub>2</sub> fixation – C3 and C4 pathways – Significance of C4 pathway – CAM pathway and its significance – Photorespiration and its significance – Photosynthetic efficiency of C3, C4 and
2. CAM plants - Factors affecting photosynthesis (light, CO<sub>2</sub>, temp and water stress) - Relationship of photosynthesis and crop productivity.
3. Respiration – Energy balance – Significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP) and its significance – Growth respiration and maintenance respiration – Alternate respiration – Salt respiration – Wound respiration.

**UNIT 3**

1. Lipid metabolism – Biosynthesis of fatty acids in plastids – Functions of lipids -Significance of lipids in plant metabolism.
2. Physiology of flowering – Photoperiodism and flowering – Importance of photoperiodism – Classification of plants based on photoperiodic responses – Perception of photoperiodic

stimulus – Biological clock – Phytochrome – Flowering hormones – Vernalization and flowering – importance of vernalization in agriculture.

#### **UNIT 4**

1. Plant growth regulators – Auxins – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses.– Gibberellins – occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses
2. Cytokinins – Occurrence, transport, biosynthesis, mode of action and physiological roles – commercial uses –
3. ABA – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses –

#### **UNIT 5**

1. Ethylene – Occurrence, transport, biosynthesis, mode of action and physiological roles – Commercial uses.
2. Senescence and abscission – Definition – Classification of senescence – Physiological and biochemical changes that occur during senescence - Prevention of leaf and flower senescence – Abscission and its relationship with senescence.
3. Fruit ripening - Climacteric and non climacteric fruits – Metabolic changes during fruit ripening - Hormonal regulation of fruit ripening – Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers.

#### **REFERENCE BOOKS:**

1. GOPALA CHANDRA DE.(1989) FUNDAMENTALS OF CROP PHYSIOLOGY. Oxford & IBH Publishing Company Pvt Ltd , New Delhi

**B.VOC: Agriculture  
Semester-II,  
2020-2021  
OJT (ON JOB TRAINING)**

**Teaching Hours:2**

**Credits:1**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING & SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

IDEAL COLLEGE OF ARTS AND SCIENCES  
(A.P. GOVT., AIDED, AUTONOMOUS & NAAC B) DR.  
P.V.N. RAJU VIDYAPRANGANAM, KAKINADA

Bachelor of Vocation: Agriculture

**Course structure and syllabi: w.e from 2021-22 Admitted Batch  
Semester –III**

S.No	Name of the Subject	Total Marks	Mid. Sem Exam	Sem. End Exam	Teaching Hours	Credits
1	English	100	30	70	4	3
2	Telugu	100	30	70	4	3
3	Analytical Skills (LSC-1)	50	---	50	2	2
4	Environmental Education (LSC-2)	50	---	50	2	2
5	Online Business (SD)	50	---			
6	Chemistry (Organic chemistry and spectroscopy)	100	30	70	4	4
7	Chemistry (Practical –III organic preparation and IR spectra analysis)	50	---	50	2	1
8	Agronomy of field crops	100	30	70	4	4
9	Agronomy of field crops Practical	50	--	50	2	1
10	Manures fertilizers and soil fertility management	100	30	70	4	1
11	Manures fertilizers and soil fertility management practical	50	---	50	2	1
12	Agricultural economics and farm management	100	30	70	4	4
13	On Job Training	50	---	50	2	1
		900	180	720	36	29

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester - III**  
**AGRONOMY OF FIELD CROPS**

**Credits: 4**

**Teaching Hours: 4**

**Learning outcomes:**

**This course deals with the actual crop husbandry aspects of various important crops. After completion of the course the students should be in a position to**

- 1. Raise the crops independently following the package of practices for higher yields**
- 2. Selection of the crops, varieties/hybrids**
- 3. Preparation of land, irrigation and drainage channels etc.,**
- 4. Harvesting of crop at right time, processing and storage**
- 5. How to avoid losses at all stages of crop growth due to pests, diseases and nutritional disorders**

**Syllabus \ course outlines**

**UNIT-I: PACKAGE OF PRACTICES TO RAISE THE CEREALS : Rice, wheat.**

**UNIT-II: : PACKAGE OF PRACTICES TO RAISE THE MILLETS : Maize, sorghum, Pearl millet, Finger millet, Proso millet, Kodo millet, Foxtail millet, Little millet, Barnyard millet**

**UNIT-III: : PACKAGE OF PRACTICES TO RAISE THE PULSES: Pigeon pea, Green gram, Black gram, Bengal gram, Peas, Horse gram, Cowpea**

**UNIT-IV: : PACKAGE OF PRACTICES TO RAISE THE OIL SEEDS: Ground nut, Sesame, Sunflower, Castor, Rape seed, mustard, safflower, niger, Coconut and oil palm**

**UNIT-V: : PACKAGE OF PRACTICES TO RAISE THE SUGAR & FIBER CROPS: Sugarcane, Sweet sorghum, Cotton, Jute, Mestha, Sunhemp and other crops**

**: PACKAGE OF PRACTICES TO RAISE THE OTHER CROPS AND FODDER CROPS:: Tobacco, Fodder sorghum, cowpea, Napier, Lucerne, Berseam AND OATS**

**Bachelor of Vocation: AGRICULTURE 2020-  
2021 Admitted Batch onwards  
II Year Semester - III  
AGRONOMY OF FIELD CROPS  
(PRACTICAL)**

**Credits:1**

**Teaching Hours: 2**

1. Identification of cereals, millets, pulses, oil seed, sugar and fiber crops in the crop  
Cafeteria.
2. Practicing various nursery types and main field preparation for field crops.
3. Acquiring skill in different seed treatment techniques in important field crops.
4. Estimation of plant population, seed rate and fertilizer requirement for important field
  
5. Acquiring skill in field preparation, sowing and manuring of crops under pure and intercropping situations for field crops.
6. Acquiring skill in using seed drill for sowing operations.
7. Observations on growth parameters of cereals, millets, pulses, green manures and forage
  
8. Study on yield parameters and estimation of yield in field crops.
9. Working out cost and returns of important cereals, millets and pulses.
10. Collection of seeds of field crops.

**Reference Books**

1. Reddy , S R and Reddi Ramu 5th edition 2016, Agronomy of Field Crops- Kalyani , Ludhiana.
2. Chidda Singh, Singh ,P and Singh R, Modern Techniques of Raising field crops- oxford publishing house, New Delhi.
  
- 3 Rajendra Prasad 2004 text book of Field Crop Production Volume i, Volume ii
  
- 4 Panda S C 2014 Agronomy of Fodder a forage crops, kalyani publishers Ludhina

**Bachelor of Vocation: AGRICULTURE 2020-2021**  
**Admitted Batch onwards**  
**II Year Semester – III**

**MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT**

**Credits: 4**

**Teaching Hours: 4**

**Learning Out Comes:**

**After the completion of the course, the students should be able to**

- 1. understand the essential nutrients for the crop growth, their deficiency symptoms and remedial measures**
2. Understand the methods of manufacture of urea, ammonium sulphate, SSP, DAP, MOP and SOP. Complex, mixed fertilizers, customized/Specialty fertilizers – Water soluble fertilizers, liquid fertilizers.
3. Understand various methods of fertilizer application
4. understand the concepts of INM (integrated nutrient management), STCR, IPNS, SSNM (Site Specific Nutrient Management) and RTNM

**Syllabus of the course:**

**Unit–I :** Essential Nutrients Soil fertility and productivity-Essential nutrients – functions, deficiency and toxicities. Concepts and methods of soil fertility evaluation.

Nutrient Dynamics Nutrients – sources, forms, mobility, transformations, fixation, losses and availability of nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, iron, manganese, zinc, copper, boron, molybdenum, nickel, chloride in soils – Beneficial elements – Nutrient interactions.

**Unit–II :** Classification of Fertilizers

Fertilizers – Definition and classification, sources, properties and reactions of primary, secondary and micro nutrient fertilizers in soil – Manufacture of urea, ammonium sulphate, SSP, DAP, MOP and SOP. Complex, mixed fertilizers, customized/Specialty fertilizers – Water soluble fertilizers, liquid fertilizers. Micro nutrient mixtures and chelated micronutrients – Preparation, characteristics and compatibility – Fertilizer Control Order (FCO). Manures – classification, nutrient contents. Composting techniques.

**Unit–III :** Application Methods

Methods of fertilizer application – Seed coating, palletization, seedling dipping – Nutriseed pack – Soil Application – Foliar spray – Fertigation – water soluble fertilizers, fertigation scheduling ( Fertilizer – water interaction, fertilizer solubility, comparison of fertilizer application methods).

**Unit–IV :** Nutrient Management

Nutrient management concepts – INM, STCR, IPNS, SSNM and RTNM. Nutrient use efficiencies of major and micronutrients and enhancement techniques (Soil, Cultural and Fertilizer strategies). Soil health – Quality indices and their management – Long term effect of fertilization on soil.



**Unit–V:** Compost and composting- Green manures- Definitions of penning -Introduction and importance of organic manures- Bulky organic manures- Different methods of composting including the starters and raw materials.

## **Bachelor of Vocation: AGRICULTURE**

**2020-2021 Admitted Batch onwards  
II Year Semester – III**

### **MANURES, FERTILIZERS AND SOIL FERTILITY MANAGEMENT (PRACTICAL)**

**Credits:1**

**Teaching Hours: 2**

1. Introduction to analytical instruments and principles-spectrometry and flame photometry
2. Estimation of available N in soils
3. Estimation of available P in soils
4. Estimation of available K in soils
5. Estimation of available S in soils
6. Estimation of available Ca and Mg in soils
7. Estimation of available Zn in soils
8. Basic of plant analysis and estimation on N in plant samples
9. Estimation of P in plant samples
10. Estimation of K&S in plant samples
11. Identification acid radicals in fertilizers / salts
12. Identification of basic radicals in fertilizers / salts
13. Estimation of N in Ammonium sulphate
14. Estimation of N in Urea and FYM
15. Estimation of water soluble P<sub>2</sub>O<sub>5</sub> SSP
16. Estimation of K Muriate of potash or Sulphate of potash by using flame photo meter.

#### **References**

1. Indian Society of Soil Science.2012. Fundamentals of Soil Science. IARI, New Delhi
2. .Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. Manures and Fertilisers. Agril. Publishing House, Nagpur
3. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005. Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillian Publishing Co., New York.
4. D. K .Das 2014. Introductory Soil Science. Kalyani Publishers, New Delhi

**Bachelor of Vocation: AGRICULTURE**

**2020-21 Admitted Batch  
II Year Semester – III**

**AGRICULTURAL ECONOMICS & FARM MANAGEMENT**

**CREDITS: 4**

**Teaching Hours: 4**

**Theory: Learning Outcome:**

On successful completion of this course, the student will be able to

- Understand basic principles of Agricultural economics. How it is different from normal economics
- Understand the basics of demand, supply, and consumer's equilibrium
- Understand the elementary knowledge of Production, market structure, market dynamics and Distribution theory
- Understands the fundamental concepts of public finance, agriculture taxation, VAT, GST
- Understand the roles of money, banking, credit, price index credit and role of credit policy

**COURSE OUTLINES –SYLLUBUS OF THE COURSE**

**UNIT I:**

Economics – meaning – definitions – subject matter of economics – traditional approach – Modern approach – microeconomics and macroeconomics- Agricultural economics –definitions – meaning – importance of agricultural economics-branches of agricultural economics - Agricultural production economics – meaning – definitions –Farm management –meaning–scope – definitions – objectives.

; Agricultural marketing – meaning – definition – importance of agricultural marketing.

Basic terms and concepts in economics – goods and services – free and economic goods, utility. Value – definition – characteristics; price – meaning; wealth – meaning – attributes of wealth – Wants – meaning - characteristics of human wants.

Law of diminishing marginal utility – statement – assumptions of law – explanation –limitations of the law – importance- Law of equi-marginal utility – meaning – assumptions – explanation of the law limitations of the law – practical importance

**UNIT 2**

Consumer's surplus – meaning – assumptions – explanation – difficulties in measuring consumer's surplus – importance.

Demand – meaning – definition – types of demand – income demand, price demand and cross demand Demand schedule – demand curve – Law of demand – Elasticity of demand – meaning – elastic and inelastic demand – kinds of elasticity of demand. 3.Price elasticity – income elasticity and cross elasticity of demand – practical importance of elasticity of demand.

Supply – meaning – definition – Law of supply – supply schedule – supply curve Increase and decrease in supply – contraction and extension of supply – factors affecting supply -Elasticity of supply – kinds of elasticity of supply.

Markets – definition – essentials of market – classification of market structure – perfect and imperfect markets Characteristics of monopolistic competition – monopoly and oligopoly.

### UNIT 3

National income – concepts of national income – gross domestic product, gross national product, net national product, net domestic product -Methods of measurement of national income – product method, income method and expenditure method.

Public finance – meaning – role and importance of public finance – functions of the government – differences between public finance and private finance Public revenue.

Tax – meaning – classification – direct and indirect taxes – methods of taxation – proportional, progressive, regressive and degressive taxation, agricultural taxation -other types of taxation – Value Added Tax (VAT) -Canons of taxation

Public expenditure – social and economic balanced regional growth, development of agriculture and industry, exploitation and development of mineral resources and subsidies and grants to local governments, and exports .

### UNIT 4

Inflation – meaning – definition – related concepts of inflation – deflation, disinflation, stagflation and reflation.

Measurement of inflation - consumer price index, wholesale price index, producer price index and GDP deflator.

Types of inflation – demand pull and cost push inflation – comprehensive and sporadic inflation – suppressed and repressed inflation – creeping, walking, running and galloping inflation – markup inflation- Causes of inflation.

### UNIT 5

Factors causing increase in demand – increase in money supply, increase in disposable income, increase in public expenditure, increase in consumer spending.

Cheap monetary policy, deficit financing and increase in exports, factors causing shortage of supply – shortage of factors of production, industrial disputes, natural calamities, artificial scarcities, increase in exports, lop-sided production

Law of diminishing returns and international factors

Remedial measures to control inflation – monetary measures – credit control, demonetization of currency and issue of new currency – fiscal measures-

**B.VOC: Agriculture**  
**Semester-III, 2020-2021**  
**OJT (ON JOB TRAINING)**

**Teaching Hours:2**

**Credits:1**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING & SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

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P.V.N. RAJU VIDYAPRANGANAM, KAKINADA

Bachelor of Vocation: Agriculture

**Course structure and syllabi: w.e from 2021-22 Admitted Batch  
Semester –IV**

S.No	Name of the Subject	Total Marks	Mid. Sem Exam	Sem. End Exam	Teaching Hours	Credits
1	English	100	30	70	4	3
2	Telugu	100	30	70	4	3
3	Chemistry (inorganic, organic and physical chemistry)	50	---	50	2	2
4	Chemistry (practical –IV organic qualitative analysis )	50	---	50	2	1
5	Chemistry (inorganic and physical chemistry)	100	30	70	4	4
6	Chemistry (practical –V course conductometric and potentiometric titrimetry)	50	---	50	2	1
7	Pest of field crops and their management	100	30	70	4	4
8	Pest of field crops and their management practicals	50	---	50	2	1
9	Water management	100	30	70	4	1
10	Water management practical	50	---	50	2	1
11	Principles of Organic farming	100	30	70	4	4
12	Principles of Organic farming practical	50		50	2	1
13	Farm Power and Machinery					
14	On Job Training	50	---	50	2	1
		900	180	720	36	29

**Bachelor of Vocation: AGRICULTURE 2020-2021**

**Admitted Batch onwards**

**II Year Semester – IV**

**PESTS OF FIELD CROPS AND THEIR MANAGEMENT**

**Credits:4**

**Teaching Hours: 4**

**Learning Out Comes:**

**After completion of the course every student should able to**

- 1. Understand the various insects that damage the crop plants, thereby causing economic loss to the farmers.**
- 2. Identify the casual organism, insect by seeing the symptoms, etiology, assess the loss**
- 3. Should able to identify, take up correct ameliorative measures to immediately check the damage and further infestation.**
- 4. Should able to measure the dosage of chemical, proper method and safe way of application of the insecticide**

**SYLLABUS:**

**UNIT: I:**

Pests of Cereals and Millets Distribution, bionomics, symptoms of damage and management strategies for insect pests and integrated pest management of rice, wheat, maize, sorghum, cumbu and ragi.

**Unit II:**

Pests of Pulses and Oilseeds Distribution, bionomics, symptoms of damage and management strategies of insect pests and integrated pest management of pulses (grams, cowpea.), groundnut, castor, gingelly, sunflower, safflower, soybean and mustard.

**Unit III.**

Pests of Cotton and Sugarcane Distribution, bionomics, symptoms of damage and management strategies of insect pests and integrated pest management of cotton and sugarcane.

**Unit IV:**

Pests of Green Manures, Stored Products, bionomics, symptoms of damage and management strategies of pests of green manures (Sunnhemp, Sesbania, Daicha)and stored products.

**Unit V:**

Rodents and birds of agricultural importance and their management. Locusts and their management.

**Bachelor of Vocation: AGRICULTURE 2020-2021**

**Admitted Batch onwards**

**II Year Semester – IV**

**PESTS OF FIELD CROPS AND THEIR MANAGEMENT  
(PRACTICAL)**

**Credits1**

**Teaching Hours:2**

1. Pests of rice
2. Pests of maize, sorghum and cumbu
3. Pests of wheat and ragi
4. Pests of grams and cowpea
5. Pests of groundnut, gingelly and sunflower
6. Pests of castor, soybean, safflower and mustard
7. Pests of cotton
8. Pests of sugarcane
9. Pests of stored products
10. Gadgets for management of stored product insects.
11. Calculation on the doses and their application techniques
12. Assessment of loses in stored grain pests, fumigation of grains stored in godowns
13. Visit to nearest FCI/AWC/SWC godown

**Reference Books**

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. Khare, S.P 1993 Stored Grain Pests and their Management, kalyani publishers, Ludhina.



**Bachelor of Vocation: AGRICULTURE 2020-2021**  
**Admitted Batch onwards**  
**II Year Semester – IV**

**WATER MANAGEMENT**

**THEORY CREDITS: 4**

**Teaching Hours :4**

**LEARNING OUT COMES:**

**After completion of this course the student should understand**

- 1. the concept of weed, weed-crop plant competition, loss due to weeds, weed menace**
- 2. the ways to identify the weeds in a crop, the ways to control the weeds economically**
- 3. critical stages of crop growth sensitive to weed menace weed control measures, integrated weed management**
- 4. roll of water in crop growth, yield, weed control and nutrient up take**
- 5. sources of irrigation water, types of irrigation, field capacity, losses of irrigation water – prevention**
- 6. drainage of excess water- losses due to floods**

**Lecture outlines Theory**

**UNIT 1**

Importance and History of Irrigation

1. Role of water in plant growth – Importance of irrigation – Water resources and irrigation potential of India – History and development of irrigation in India – Irrigation systems of India.

**UNIT 2**

1. Soil-water relations – physical properties of soil viz., depth, soil texture, soil structure, particle density, bulk density and porosity influencing water retention, movement and availability.
2. Water retention in soil – adhesion and cohesion – soil moisture tension – pF –soil moisture characteristic curves- Water movement in soils – infiltration – percolation – seepage – permeability – hydraulic conductivity – saturated and unsaturated water flow.
3. Kinds of water in soil – gravitational water – capillary water – hygroscopic water – their importance in crop production - Soil moisture constants – saturation – Field capacity (FC) – Permanent Wilting Point (PWP) – Available Soil Moisture (ASM) – hygroscopic coefficient –theories of soil water availability.
4. Plant-water relationships – rooting characteristics – effective root zone depth – moisture extraction pattern – moisture sensitive periods of crops – Soil Plant Atmospheric Continuum (SPAC).

**UNIT 3**

5. Evapotranspiration – evaporation – transpiration – factors influencing evapotranspiration – Reference crop evapotranspiration (ET<sub>o</sub>) – Crop coefficient – Crop Evapotranspiration (ET<sub>c</sub>) - daily, seasonal and peak period consumptive use.
6. Crop water requirement – irrigation requirement – net and gross irrigation requirement – irrigation interval – irrigation period – seasonal water requirement of important crops – duty of water – base period – relation between duty and base period – conjunctive use of water – advantages of conjunctive use.
7. Scheduling of irrigation – different criteria – soil moisture regime approach – feel and appearance method – soil moisture tension and depletion of available soil moisture method - climatological approach – Irrigation Water (IW) / Cumulative Pan Evaporation (CPE) ratio method.
8. Scheduling of irrigation – plant indices approach – visual symptoms – soil cum sand mini plot technique – growth rate – relative water content – plant water potential – canopy temperature – indicator plants and critical growth stages.

#### **UNIT 4**

1. Methods of irrigation - surface methods – wild flooding check basin, ring basin, border strip, furrow and corrugations – advantages and disadvantages- Sub surface irrigation.
2. Micro irrigation systems - sprinkler irrigation – merits and demerits – system components and layout – suitable crops – rain guns.
3. Drip irrigation (surface and sub surface) – merits and demerits – system components and layout – suitable crops - fertigation and maintenance of micro irrigation systems.

#### **UNIT 5**

1. Water Use Efficiency (WUE) – crop and field water use efficiency – factors influencing WUE – climatic, genetic and management (agronomic) factors - Irrigation efficiencies – water conveyance efficiency, water application efficiency, water storage efficiency, water distribution efficiency and project efficiency.
2. Quality of irrigation water – salinity hazard, sodium hazard, residual sodium carbonate and boron toxicity – criteria and threshold limits – management practices for using poor quality water.
3. Water logging – causes for waterlogging – drainage- surface and sub-surface drainage systems

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester – IV**

**WATER MANAGEMENT**  
**(Practical)**

**Credits:1**

**Teaching Hours: 2**

1. Installation and working with tensiometer and resistance blocks
2. Determination of field capacity by field method Measurement of soil moisture content by moisture probe
3. Measurement of irrigation water through flumes, weirs and V notches
4. Calculation of irrigation water requirements
5. Lay out of surface irrigation methods
6. Demonstration of drip irrigation system (filter cleaning, flushing of laterals and fertigation)
7. Demonstration of operation of sprinkler irrigation system
8. Visit to micro irrigation systems in farmers fields.
9. Water management practices in rice, wheat and maize.
10. Water management practices in groundnut, sunflower and sugarcane.

**References**

1. Michael, A.M. 2006. Irrigation – Theory and Practice. Vikas Publishing House Pvt. Ltd., New Delhi.
2. Reddy, S.R. 2016. Irrigation Agronomy 3 rd Edition. Kalyani Publishers, Ludhiana.
3. Sankara Reddi, G.H. and Yellamanda Reddy, T. 2006. Efficient Use of Irrigation Water.. Kalyani Publishers, Ludhiana.
4. Majumdar, D.K. 2013. Irrigation water management: Principles and practices. PHI learning Pvt Ltd, Delhi-92

**Bachelor of Vocation: AGRICULTURE 2020-2021**

**Admitted Batch onwards**

**II Year Semester – IV**

**PRINCIPLES OF ORGANIC FARMING**

**Credits:4**

**Teaching Hours: 4**

**Learning Out Comes:**

1. After completion of this course, the students should be able to
1. Understand the definition of organic farming, key differences against chemical farming, scope, advantages and limitations.
2. Relevance of organic farming in current situations, health advantages, future prospects
3. Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India.
4. Marketing and export potential of organic products and national economy.
5. Nutrient management in organic farming is very important

Theory LECTURE OUT LINES

**UNIT 1**

1. Organic farming – definition – need – scope – principles – characteristics - relevance to modern agriculture.
2. Different eco friendly farming systems- biological farming, natural farming, regenerative agriculture – permaculture - biodynamic farming.
3. Relevance of organic farming to A.P, India, and global agriculture and future prospects- advantages - barriers.

**UNIT 2**

1. Initiatives taken by the central and state governments, NGOs and other organizations for promotion of organic agriculture in India.
2. Organic nutrient sources and their fortification – organic manures- methods of composting
3. Green manures- bio fertilizers – types, methods of application – benefits and limitations.
4. Nutrient use in organic farming-scope and limitations.

**UNIT 3**

1. Nutrient management in organic farming.
2. Organic ecosystem and their concepts.
3. Choice of crops and varieties in organic farming – crop rotations – need and benefits – multiple cropping.
4. Fundamentals of insect, disease and weed management under organic mode of production-cultural- biological methods-non chemical pest and disease management.

**UNIT 4**

1. Botanicals- pyrethrum, neem seed kernel extract, neem seed powder, soluble neem formulations, neem oil.
2. Operational structure of NPOP – other agencies for organic production.
3. Inspection – certification - labeling and accreditation procedures for organic products.

**UNIT 5**

1. Processing, - economic consideration and viability.
2. Marketing and export potential of organic products – National economy.

**Bachelor of Vocation: AGRICULTURE 2020-2021**

**Admitted Batch onwards**

**II Year Semester – IV**

**PRINCIPLES OF ORGANIC FARMING**

**(Practical)**

**Credits:1**

**Teaching Hours: 2**

1. Visit to organic farm to study the various components, identification and utilisation of organic products.
2. Compost making- aerobic and anaerobic methods
3. Vermicompost preparation
4. Preparation of enriched farm yard manure
5. Visit to organic clusters and bio control lab to study the maintenance of biofertilizers/bio-inoculant cultures
6. Biological nitrogen fixers.
7. Methods of application of Bio-pesticides (Trichocards, BT, NPV)
8. Preparation of neem products and other botanicals for pest and disease control
9. Preparation of green pesticides (panchagavya, beezamrutam, jeevamrutam, ghanajeevamrutam, dravajeevamrutam).
10. Different methods of biofertiliser applications.
11. Quality analysis of biofertilisers/bioinoculants and compost
12. Case studies of Indigenous Technical knowledge (ITK) for nutrient , insect, pest, disease and weed management
13. Economic analysis of organic production system
14. Study of post harvest management in organic farming
15. Study of quality parameters of organic produce
16. Visit to organic farms to study the various components and their utilization

**References**

1. Arun K. Sharma. 2002. A Hand book of organic farming. Agrobios, India. 627p.
2. Palaniappan, S.P and Annadurai, K.1999. Organic farming-Theory and Practice. Scientific publishers, Jodhpur,India. 257p.
3. Mukund Joshi and Prabhakarasetty, T.K. 2006. Sustainability through organic farming. Kalyani publishers, New Delhi. 349p.
4. Balasubramanian, R., Balakishnan, K and Siva Subramanian, K. 2013. Principles and practices of organic farming. Satish Serial Publishing House. 453p 39
5. Tarafdar, J.C., Tripathi, K.P and Mahesh Kumar, 2009. Organic agriculture. Scientific Publishers, India. 369p.

**Bachelor of Vocation: AGRICULTURE 2020-2021**

**Admitted Batch onwards**

**II Year Semester – IV**

**FARM MACHINERY AND POWER**

**Credits:4**

**Teaching Hours: 4**

Learning Out Comes:

After completion of the course the students should able to understand

1. That farm power and machinery is a very important course and back bone of all the agricultural operations
2. That knowing the working of engines of tractors, power tillers, sprayers etc is also very important. Working knowledge of all the machinery is an advantage
3. Knowledge of equipment used for land preparation, sowing, transplanting, weeding, spraying and harvesting is highly useful for practicing Agriculture
4. Practice of driving tractor along with implements, power tillers, Sprayers is highly advantages for students transforming as entrepreneurs

**Lecture outlines**

**Theory**

**UNIT 1**

1. Farm power – Source of different farm power, advantages and disadvantages.
2. Internal combustion engine - Different components and their functions - Working Principle of four stroke and two stroke cycle engine - Comparison between diesel and petrol engine - Difference between four and two stroke engines.
3. Terminology related to engine power - IHP, BHP, FHP, DBHP, compression ratio, stroke bore ratio, piston displacement, and mechanical efficiency – Numerical problems on calculation of IHP, BHP, C.R., stroke bore ratio, piston displacement volume.
4. Fuel supply and cooling system of I.C. engine – Types, components and their functions, working principle of forced circulation cooling system.
5. Ignition and power transmission system of I.C engine – Types, components and their functions, working principle of battery ignition system.

**UNIT 2**

1. Lubrication system of I.C. engine – Types, purpose, components and their functions, working principle of forced feed system - Tractors classification, types, points to be considered in selection of tractors, estimating the cost of operation of tractor power.
2. Tillage - Primary and secondary tillage - M.B. plough – Functions, constructional features, operational adjustments and maintenance.
3. Disc plough – Functions, constructional details, operational adjustments and maintenance.
4. Numerical problems on M.B. plough and disc plough.

**UNIT 3**

1. Harrows – Types, functions, operation of disc harrows - Cultivators – Rigid and spring loaded types - Puddlers, cage wheel, rotovators - Intercultural implements – Hoes and weeders for dry and wetland cultivation.
2. Sowing equipment - Seed cum fertilizer drills – Types, functions, types of metering mechanisms, functional components, calibration - Paddy transplanters.
3. Harvesting equipment – Sickles, self propelled reaper, alignment and registration - Combines, functions of combines.

#### **UNIT 4**

1. Plant protection equipment – Types of sprayers, constructional features of knapsack sprayer, hand compression sprayer, foot sprayer, rocker sprayer and power sprayer, care and maintenance of sprayers.
2. Dusters – Hand rotary and power operated dusters, care and maintenance of dusters.

#### **UNIT 5**

1. Tractor mounted equipments for land development and soil conservation –Functions of bund former, ridger, and leveling blade.
2. Threshing equipment and principles of combine harvester.

#### **References:**

- a. Farm Power And Machinery Management. Donnel hunt. MEDTEC publications

**Bachelor of Vocation: Agriculture**  
**2020-21 Admitted Batch**  
**II Year Semester – IV**  
**ON JOB TRAINING**

**Teaching Hours:2**

**Credits:1**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>



**B VOC (AGRICULTURE)**  
**2020-2021 Admitted Batch**  
**I Year Semester – I**

**MODEL QUESTION PAPER**  
**INTRODUCTION TO AGRONOMY**

**Time: 3 Hours**

**Maximum: 75 Marks**

**SECTION – A**

Answer any **FIVE** questions. Each question carries equal marks.

5x5M=25M

1. Define Agronomy? Discuss about its scope & importance briefly.
2. Write a note on Agro Climatic Zones of Andhra Pradesh.
3. What do you mean by sustainable Agriculture? Mention the Features of Sustainable Agriculture.
4. Write a note on tillage and list out the importance of tillage.
5. Discuss about zero tillage and Stubble nuclear tillage.
6. Differentiate between manures and fertilizers.
7. What do you mean by cropping system and cropping pattern?
8. What is a Crop? Classify the crops.

**SECTION – B**

Answer All the questions. Each question carries **TEN** marks

(5x10M = 50 M)

1. a) Write a detailed note on Integrated Farming System (IFS).  
(OR)  
b) Discuss about Organic Farming.
2. a) What do you mean by fertilizers? Write a note on methods of fertilizer application.  
(OR)  
b) Future Scope of Organic Agriculture.
3. a) What is a Weed? Describe the methods of Weed control.  
(OR)  
b) What do you mean by manures? List out the most Familiar manures.
4. a) Write a detailed note on modern concepts of tillage.  
(OR)  
b) Write an essay on Crop establishment methods.
5. a) What is irrigation? List out the methods or types of irrigation.  
(OR)  
b) Mention the objectives and importance of tillage

**B.VOC. AGRICULTURE**  
**I YEAR, I SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: INTRODUCTION TO AGRONOMY**

**MODEL PAPER**

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**Time: 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of Vocation: AGRICULTURE  
2020-21 Admitted Batch  
I Year Semester – I**

**MODEL QUESTION PAPER  
INTRODUCTION TO SOIL SCIENCE**

Time: 3 Hours

Maximum: 75 Marks

**SECTION – A**

**Answer any FIVE questions. Each question carries equal marks.**

**5x5M=25M**

1. Define Soil? Why it is called OS natural body?
2. Discuss about the profile of the Soil.
3. What do you mean by soil texture and soil structure?
4. Write a note on soil Air and Soil water.
5. What do you mean by soil color? What was the impact of soil color on crop growth.
6. Define Soil Science and mention the importance of soil science knowledge.
7. What is Soil survey and dismiss about soil survey reports.
8. Write a note on classification of soil.

**SECTION – B**

**Answer All the questions. Each question carries TEN marks**

**(5x10M = 50M)**

1. a) What do you mean the seep out of top soil? What were types of it.  
**(OR)**  
b) What is drainage? Write its types.
2. a) Write a detailed note on soil relations.  
**(OR)**  
b) What is ion? What do you mean by ionic exchanger? Discuss about cat ion exchange capacity.
3. a) Write an essay on soil organic matter? Its importance for flora & Fauna of soil.  
**(OR)**  
b) Write about the chemistry of soil? Discuss about bulk and practical density.
4. a) Write a note on Porosity of soil.  
**OR**  
b) Discuss about nitrogen transformation in detailed manner.
5. a) Scope and importance of soil sciences and how it helps for future agriculture.  
**(OR)**  
b) Write a note on sulfur transformation

**B.VOC. AGRICULTURE**  
**I YEAR, I SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: INTRODUCTION TO SOIL SCIENCE**

**MODEL PAPER**

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**Time: 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of Vocation: AGRICULTURE**

**2020-21 Admitted Batch**

**I Year Semester – I**

**MODEL QUESTION PAPER**

**PRINCIPLES OF PLANT BREEDING**

Time: 3 Hours

Maximum: 75 Marks

**SECTION –A**

**Answer any FIVE questions. Each carries equal marks.**

**5x5M=25M)**

1. Merits and demerits of plant introduction.
2. Define multiline concept and Characters of good multiline.
3. What is major aim and objectives of plant breeding?
4. What is mutation breeding and procedures of mutation breeding?
5. Explain horizontal and vertical resistance.
6. Compare the difference between dominance and over dominance hypotheses.
7. Compare the difference between pedigree and bulk method.
8. Define hybridization and steps involved in hybridization.

**SECTION –B**

**Answer All the questions. Each question carries TEN marks**

**(5x10M= 50M)**

1. A) what is polyploidy breeding explain their origin and application in crop improvement  
(Or)  
B) Write about morphological and cytological features of allopolyploid.
2. A) What are the merits and demerits of composite and synthetic varieties.  
(Or)  
B) What are the steps involved in production of single and double cross hybrids.
3. A) Explain mechanism of drought resistance and features associated with drought resistance.  
(Or)  
B) Write the procedure of mutation breeding, what are the disadvantages and advantages of mutation breeding.
4. A) Define inbreeding depression. What are procedures involved in development of inbred  
(Or)  
B) Define self-incompatibility and its classification
5. A) What is male sterility, Write about genetic consequences of male sterility.  
(Or)  
B) What are the factors effecting Hardy- Weinberg law.

**B.VOC: Agriculture**  
**Semester-I, 2020-2021**  
**OJT (ON JOB TRAINING)**

**MODEL PAPER**

**Total Marks: 50**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

**Bachelor of Vocation: AGRICULTURE  
2020-21 Admitted Batch  
I Year Semester – II**

**MODEL QUESTION PAPER  
INTRODUCTION TO ENTOMOLOGY**

**Time : 3 Hours**

**Max Marks: 75**

**SECTION-A**

**ANSWER ANY FIVE QUESTIONS**

**[5x5M=25M]**

- 1: Explain the characteristics of phylum arthropoda and its classes?
- 2: Write about the reasons for insect dominance?
- 3: What is moulting and what are steps involved in moulting?
- 4: Write about body regions of thorax with diagram?
- 5: What is taxonomy and systematics? Write about systematic position of Grasshopper?
- 6: Explain the differences between Apterygota and Pterygota with examples?
- 7: Write the differences between Exopterygota and Endopterygota with examples?
- 8: Explain the types of reproduction?

**SECTION B**

**ANSWER ALL QUESTIONS**

**[5x10M=50M]**

- 1: Write about history and its importance of entomology.

{OR}

Describe the relationship of insects with other arthropods.

- 2: Describe the insect body wall with diagram.

{OR}

Explain about body regions of insects with diagram.

- 3; Explain the digestive system of cockroach with neat labelled diagram.

{OR}

Explain respiratory system of insects with neat labelled diagram.

- 4: Write the differences between and hemiptera homopetra .{OR }

Write about the characteristics of odonatan and write the differences between Anisoptera and Zygoptera.

5. List out the apterygotan and ptergotan orders with examples.

{OR}

Write about coleopteron and lepidopteron orders characteristics with examples.

**B.VOC. AGRICULTURE**  
**I YEAR, II SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: INTRODUCTION TO ENTOMOLOGY**

**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment		1x15 = 15M
II.	Minor experiment		1x10 = 10 M
III.	Identification		3x05 = 15 M
IV.	Record		1x 05 = 05 M
V.	Viva Voce	5	M



**Bachelor of Vocation: AGRICULTURE**

**2020-21 Admitted Batch  
I Year Semester – II**

**INTRODUCTION TO PLANT PATHOLOGY  
MODEL QUESTION PAPER**

**Time: 3 Hours**

**SECTION-A**

**Max. Marks =75**

- **Answer any FIVE questions.**

**5x5M=25M**

1. What is plant pathology & Write down the importance of plant pathogens.
2. Write about General characteristics of fungi and its somatic structure.
3. Explain General characteristics of plant pathogenic Bacteria.
4. List out any six important plant bacterial diseases.
5. Write about characteristics of phytoplasma.
6. Explain characteristics of plant viruses.
7. Explain the types of viruses with examples.
8. List out plant viral diseases and their vectors.

**SECTION-B**

**Answerer All Questions**

**5x10M=50M**

1. a) Write the difference between phytoplasma and Spiro plasma with examples.  
(or)  
b) Explain symptoms of plant viral diseases.
2. a) Write about the difference between viruses and viroids with examples.  
(or)  
b) Write the classification of plant viruses.
3. a) Write the classification of plant pathogenic bacteria.  
(or)  
b) Explain about general characteristics of plant parasitic nematodes.
4. a) Describe the types of fungal thalli and explain reproductive structures  
(or)  
b) Explain about reproduction in fungi.
5. a) Write the classification of fungi  
(or)  
b) Explain the methods of sexual reproduction.

**B.VOC. AGRICULTURE**  
**I YEAR, II SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: INTRODUCTION TO PLANT PATHOLOGY**

**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of Vocation: AGRICULTURE**  
**2020-21 Admitted Batch**  
**I Year Semester – II**

**MODEL QUESTION PAPER**  
**FUNDAMENTALS OF CROP PHYSIOLOGY**

Time: 3 Hours

Maximum: 75 Marks

**SECTION – A**

**I. Answer any five questions**

**5 x 5 = 25 M**

1. What is Water use efficiency and describe Factors affecting WUE.
2. What are the essential mineral elements and explain the Criteria of essentiality of mineral elements
3. Describe the Biological nitrogen fixation and the Free-living and symbiotic bacteria
4. Differentiate Growth respiration and maintenance respiration
5. What are flowering hormones and explain the terms Vernalization and mention importance of vernalization in agriculture.
6. Define Senescence and abscission. Explain Classification of senescence
7. Describe the physiological and biochemical changes that occur during senescence
8. What are the hormones used for Ripening induction and ripening inhibition – Use of hormones in increasing vase life of flowers.

**II. Answerer all the questions All questions carry equal marks 5 x 10 = 50 M**

1. a) Explain the different metabolic changes during seed development?  
OR  
b) What is Transpiration? Explain about Water use efficiency of C<sub>3</sub>, C<sub>4</sub> and CAM plants  
What is Water requirement / Transpiration ratio?
2. a) Explain functional roles of N, P, K, S Ca and Mg Fe and Na, and also explain Deficiency symptoms of macro and micro nutrients.  
OR  
b) Explain the Reactions of photosynthesis and Cyclic and non-cyclic photophosphorylation
3. a) Explain about C<sub>3</sub>, C<sub>4</sub> pathways and CAM pathway and their significance.  
OR  
b) Define Respiration and Energy balance. write about significance of respiration – Oxidative Pentose Phosphate Pathway (OPPP)
4. a) Explain the physiology of flowering, Photoperiodism and flowering and Importance of photoperiodism.  
OR  
b) Also explain Classification of plants based on photoperiodic responses
5. a) Explain the role of Plant growth regulators, Auxins and Gibberellins their mode of action and physiological roles and Commercial uses  
OR  
b) Explain the role of ABA, Its Occurrence, transport, biosynthesis, mode of action and physiological roles and Commercial uses Describe metabolic changes during fruit ripening and Hormonal regulation of fruit ripening

**B.VOC: Agriculture**  
**Semester-II, 2020-2021 OJT**  
**(ON JOB TRAINING)**

**MODEL PAPER**

**Total Marks : 50**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester - III**

**MODEL PAPER**

**AGRONOMY OF FIELD CROPS**

**Model question paper**

Time: 3 Hours

Maximum: 75 Marks

**SECTION – A**

**Answer any FIVE questions. Each question carries equal marks.**

**5x5M=25M**

1. Differentiate between *Corchorus capsularis* & *Corchorus Olitorius*.
2. Explain about Sorghum effect.
3. Write about Retting process of Jute.
4. Write down the Nutritional values of Bajra & finger millet
5. Classification of wheat with scientific names
6. Write briefly about different types of nurseries practiced in Rice.
7. Write down some varieties of Wheat, Maize, Sunflower, Cotton & Sorghum.
8. Write down common names, scientific names and their origins of all major & minor millets.

**SECTION – B**

**Answer All the questions. Each question carries TEN marks**

**(5x10M = 50)**

- 1.a) Write down the importance of pulses in India.

OR

- b) Write down the importance of oilseeds in India.

- 2.a) Write about SRI Method of rice cultivation.

OR

- b) Write about all planting methods of sugarcane.

- 3.a) Write general package of practices of millets.

(OR)

- b) Write general package of practices of oilseeds.

- 4.a) Write about nutrient management of Rice, wheat & Maize.

OR

- b) Write about nutrient management of Groundnut, Cotton & Sunflower.

- 5.a) Write Seed rate, sowing, nutrient management, water Management, Weed Management, harvesting & yield of groundnut.

OR

- b) Write seed rate, sowing, nutrient Management, Water Management, Weed Management, harvesting & yield of Rice.

**B.VOC. AGRICULTURE**  
**II YEAR, III SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: AGRONOMY OF FIELD CROPS**

**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021admitted Batch onwards**  
**II Year Semester - III**  
**MODEL PAPER**

**MANURES, FERTILIZERS & SOIL FERTILITY MANAGEMENT**

Time: 3 Hours

Maximum: 75 Marks

**SECTION – A**

**5x5M=25M**

**Answer any FIVE questions. Each question carries equal marks.**

1. Give formula for Nutrient use efficiency (NUE) & Nutrient requirement (NR).
2. Write about FCO with specifications of urca.
3. Explain the factors affecting for ammonification of Nitrogen.
4. Explain Sulphur cycle with suitable diagram.
5. Explain briefly about DRIS.
6. What is meant by INM & STCR and explain it briefly.
7. Write about soil application, foliar spray of fertilizers and explain about fertigation
8. Write transformations & fixation of phosphorus & Potassium.
- 9.

**SECTION – B**

**Answer All the questions. Each question carries TEN marks**

**(5x10M = 50M)**

1. a) Write functions of all essential nutrients.  
OR  
b) Write definition of toxicity symptoms of all essential.
2. a) Differentiate between manures & Fertilizers  
(OR)  
b) Differentiate between Bulky & Conc. Organic manure.
3. a) Define manures & Write down the classification of manures.  
(OR)  
b) Define composting & Write about different methods of composting.
4. a) Explain different methods of fertilizer applications with suitable tree diagram.  
OR  
b) Write about classification of nitrogenous, Phosphorus & Potassium with suitable examples.
- 5) a) Write about soil health and the parameters responsible for assessment of soil health.  
OR  
b) Write about sources, forms, mobility, transformations, fixation availability of nitrogen.

**B.VOC. AGRICULTURE**  
**II YEAR, III SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: MANURES, FERTILIZERS & SOIL FERTILITY**  
**MANAGEMENT**

**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M



**Bachelor of vocation: AGRICULTURE**  
**2020 -21 ADMITTED BATCH**  
**II Year Semester – IV**  
**MODEL QUESTION PAPER**  
**AGRICULTURE ECONOMICS & FARM MANAGEMENT**  
**SECTION – A**

**Maximum Time :3 Hours**

**Maximum Marks: 75 M**

**Answer any FIVE Questions. Each carries equal Marks**

**5x5M=25M**

1. Define Economics, Macro Economics and Micro Economics?
2. What is Demand? Explain about The Types of Demand?
3. What is Elastic and Inelastic Demand? Explain The Types of Elasticity of Demand?
4. Explain Increasing, Decreasing, constant Law of Return? With Examples?
5. Write the definitions of Monopoly, Duopoly, Monopoly Duopoly and oligopoly With Examples?
6. Define inflation and deflation? Explain Demand pull and cost push Inflation?
7. What is the Meaning of Economic system? Explain about the types of Economic systems
8. What is Economic Planning? Discuss the Importance and Elements of economic planning?

**SECTION – B**

**Answer the all questions. Each carry ten marks**

**5x10M=50M**

1. a) Write a detailed note on Law of Diminishing Marginal and statement, assumption and limitation

OR

(b) Explain Law of Equi Marginal utility, importance, assumption and limitation?

2. (a) Explain the different kinds of elasticity of demand? and their affecting factors?

OR

(b) What is the Prediction Process? Explain factor of Production, and input-output relationship of production process

3. (a) What is Elasticity of supply? Explain kinds of Elasticity of supply?

OR

(b) Explain differences between public finance and private finance?

4. (a) What is canon of taxation? And explain Adam Smith s and other canons of taxation?

OR

(b) What is per Capital Income? And Explain the different compacts included in the National Income

5. (a). Write the Meaning of capitalism ,Socialism and Mixed Economics ?And its Characteristic features

OR

(b) Explain the Five-Year Plans and their Objectives and explain NITI Ayog

**B.VOC: Agriculture**  
**Semester-III, 2020-2021 OJT**  
**(ON JOB TRAINING)**

**MODEL PAPER**

**Total Marks: 50**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester – IV**

**MODEL QUESTION PAPER**  
**Pest of Field Crops & Their management**

Time: 3 Hours

Maximum: 75 Marks

**SECTION – A**

**Answer any FIVE questions. Each question carries equal marks.**

**5x5M=25M**

1. Write down symptoms and management for Brown Plant Hopper and Green Leaf Hopper of paddy.
2. Write down symptoms and management for Stem borer and Corn worm or ear worm of maize.
3. Write down symptoms and management for Red hairy caterpillar and leaf hopper.
4. Write down symptoms and management for Leaf eating caterpillar and Diamond back moth.
5. Write down symptoms and management for Root grub and Leaf miner of groundnut.
6. Write down symptoms and management for Pink bollworm and American boll worm of cotton.
7. Write down symptoms and management for Sugarcane scales and sugarcane pyrilla
8. List out the Internal and External feeders with their scientific names of stored grain pest.

**SECTION – B**

**Answer All the questions. Each question carries TEN marks**

**(5x10M = 50)**

1. a) Write down IPM practices of Paddy.

**(OR)**

b.) Write down symptoms and management for Mustard saw fly, Groundnut aphid and sorghum gall fly.

2. a) Write down IPM practices of Pulses.

**(OR)**

b) Write down symptoms and management for termites, castor shoot borer, and castor, jassids.

3. a) Write down IPM practices of Cotton.

**(OR)**

b.) Write down symptoms and management for spotted boll worm, Red cotton bug, and cotton thrips.

4. a) Write down IPM practices of Stored grain pest.

**(OR)**

b) Write down symptoms and management for Ragi pink borer, sorghum ear head bug, and sorghum midge.

- 5 a) Write down the management practices for Rodents

**(OR)**

b) List out the pests of birds and locusts with their scientific names and their management.

**B.VOC. AGRICULTURE**  
**II YEAR, IV SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: Pest of Field Crops & Their management**

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**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester – IV**

**WATER MANAGEMENT**  
**MODEL QUESTION PAPER**

**MAX TIME :3 HOURS**

**MAXIMUM MARKS 75**

**Section A**

**I. ANSWER ANY FIVE QUESTIONS**

**5 X 5 = 25 M**

1. Write about Soil-water relations and factors effecting the water retention.
2. Explain Evapotranspiration and factors influencing evapotranspiration
3. How can we calculate crop water requirement –or irrigation requirement
4. Give a brief account of canopy temperature, indicator plants and critical growth stages.
5. What are the crops suitable for sprinkler irrigation? Explain about rain guns
6. How can you include - fertigation in micro irrigation systems?
7. Explain the terms water storage efficiency, water distribution efficiency and project efficiency.
8. Explain the drainage, surface and sub-surface drainage systems and relative merits  
FGH

**II. Write all the questions**

**5 X 10M = 50 M**

1. a) Write classification of water and their importance in crop production and also write about field capacity (FC) – Permanent Wilting Point (PWP) – Available Soil Moisture (ASM) – hygroscopic coefficient

**OR**

b) Write plant water relationships and moisture sensitive periods of crops – Soil Plant Atmospheric Continuum (SPAC).

2. a) What are the different methods, criteria of Scheduling of irrigation?

**OR**

b) Describe different methods of irrigation.

3. a) Explain sprinkler irrigation, its merits and demerits and system components and layout

**OR**

b) Describe about Drip irrigation (surface and sub surface), its merits and demerits system components and layout and suitable crops

4. a) Explain Water Use Efficiency (WUE), crop and field water use efficiency and Factors influencing WUE –

**OR**

b) How do you determine the Quality of irrigation water and also explain salinity hazard, sodium hazard, residual sodium carbonate and boron toxicity

5. a) What are the management practices for using poor quality water?

**OR**

b) What are the causes for Water logging?

**B.VOC. AGRICULTURE**  
**II YEAR, IV SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: WATER MANAGEMENT**

**MODEL PAPER**

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**Time: 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M

**Bachelor of vocation: AGRICULTURE  
2020 -21 ADMITTED BATCH  
II Year Semester – IV**

**MODEL QUESTION PAPER  
PRINCIPLES OF ORGANIC FARMING**

**MAXIMUM TIME: 3 HOURS**

**MAXIMUM MARKS:75**

**SECTION – A**

- I.** Answer any FIVE Questions .Each carries equal Marks 5x5M=25M
1. Define organic farming. What are the main principles and characteristics? Mention the relevance to modern agriculture
  2. What are the organic nutrient sources?
  3. Describe organic manures and methods of composting
  4. Explain the concept of multiple cropping and its need and benefits
  5. Write about operational structure of NPOP
  6. What are the economic considerations and viability of organic farming
  7. Explain about the processing of organic products
  8. What is the impact of organic farming on National economy

**SECTION –B**

- II. Answer all the questions** **5 x 10 =50 M**

1. a) Describe the different eco friendly farming systems biological farming, natural farming, regenerative agriculture – perm culture - biodynamic farming  
OR  
b) Explain relevance of organic farming to A.P, India, and global agriculture. Write future Prospects, advantages and barriers.
2. a) Explain the role of green manures and bio fertilizers in organic farming. Mention benefits and limitations.  
OR  
b) Explain the nutrient use in organic farming, its scope and limitations.
3. a) Write about Nutrient management in organic farming.  
OR  
b) describe organic ecosystem and their concepts.
4. a) explain about choice of crops and varieties and crop rotations in organic farming.  
OR  
b) write about different Botanical formulations used in organic farming.
5. a) Write about Inspection, certification, labeling and accreditation procedures for organic products  
OR  
b) Explain the marketing and export potential of organic products

**B.VOC. AGRICULTURE**  
**II YEAR, IV SEMESTER 2020-2021**  
**PRACTICAL PAPER TITLE: PRINCIPLES OF ORGANIC FARMING**

**MODEL PAPER**

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**Time : 3 Hrs**

**MAX.MARKS: 50**

I.	Major experiment	1x15 = 15M
II.	Minor experiment	1x10 = 10 M
III.	Identification	3x05 = 15 M
IV.	Record	1x 05 = 05 M
V.	Viva Voce	5 M



**Bachelor of Vocation: AGRICULTURE**  
**2020-2021 Admitted Batch onwards**  
**II Year Semester – IV**

**FARM POWER AND MACHENERY**  
**MODEL QUESTION PAPER**

**MAX MARKS 75**

**TIME: 3 HOURS**

**SECTION A**

**I. Answer any five questions**

**5x5 = 25 M**

1. What is the different Source of different farm power, advantages and disadvantages?
2. Explain about Fuel supply and cooling system of I.C. engine
3. What are the different types of tractors and points to be considered in selection of tractors?
4. Describe the Seed cum fertilizer drill and its advantages
5. Describe the mechanism or functioning of Paddy transplanters
6. Explain briefly about the functioning and advantages of combine harvesters of different crops
7. What are power tillers and what is the difference between tractor and power tiller?
8. What are the advantages of battery operated sprayers over traditional sprayers

**SECTION B**

**II. Answer all the questions**

**5x10 = 50 M**

1. a) Explain the principle of four stroke and two stroke cycle engine and Compare between diesel and petrol engine  

**OR**

b) Explain about Ignition and power transmission system of I.C engine
2. a) Explain briefly about Tillage - Primary and secondary tillage  

**OR**

b) Explain about the differences between functions of M.B. plough and Disc plough
- 3 a) Write about different types of Harrows and operation of disc harrows  

**OR**

b) write about Puddlers, cage wheel, and rotovators - Hoes and weeders for dry and wetland cultivation.
- 4 a) describe about different Plant protection equipment –  

**OR**

b) Describe about power sprayer, care and maintenance of sprayers.
5. a) Briefly describe Functions of bund former, ridger, and leveling blade.  

**OR**

b) Briefly describe Threshing equipment and principles of combine harvester.

**B.VOC: Agriculture**  
**Semester-IV, 2020-2021 OJT**  
**(ON JOB TRAINING)**

**MODEL PAPER**

**Total Marks: 50**

<b>CONTENT</b>	<b>EVALUATION</b>	<b>MARKS</b>
FIELD TRIPS	3X5	15
PROJECT REPORT/ INDUSTRIAL OR INSTITUTE TRAINING& SEMINAR	15+5	20
FIELD COMPONENTS	10X1	10
VIVA VOCE	-	05
<b>TOTAL</b>		<b>50</b>