ST. JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

B.SC.(HONORS) AGRICULTURE AND RURAL DEVELOPMENT WITH SINGLE MAJOR

# I SEMESTER **AGRICULTURE AND RURAL DEVELOPMENT** Time: 30hrs/week

AGRD101(2)  **FUNDAMENTALS OF AGRONOMY** Marks:100

## w.e.f AK 2023-2024 (Admitted batch)

**OBJECTIVES:**

* To identify the various tillage implements.
* To explain about cultivation of rice crop.
* To identify the various herbicides available in India.

**Course Outcomes**

At the end of the course, students will be able to

**CO1:** Explain the history and development of agriculture in India.

**CO2**: Explain crop production techniques and crop growth in relation to the environment.

**CO3**: Outline the principles and practices of weed management.

**CO4**: Discuss the classification, nomenclature, mode of action and selectivity of herbicides.

**CO5**: Compare the traditional and technology-supported practices in agriculture.

**UNIT – I: (6Hrs.)**

1. Definition of agriculture – meaning and scope of agronomy

2. History and development of agriculture in ancient India – agriculture in civilization era

3. National and International Agricultural Research Institutes in India

4. Agro-climatic zones of India – soils, land use pattern, major sources of irrigation and ground water potential

5. Agro-climatic zones of Andhra Pradesh – soils, land use pattern, major sources of irrigation and ground water potential

6. Tillage and tilth – objectives of tillage – characteristics of ideal seed bed – effect of tillage on soil properties – pore space, texture, structure, bulk density and color of the soil

**UNIT – II: (6Hrs.)**

1. Types of tillage – preparatory tillage – factors affecting preparatory cultivation, after cultivation, puddling

2. Sowing – methods of sowing – time and depth of sowing for major agricultural crops – cereals, pulses and oilseeds

3. Crop stand establishment – factors affecting optimum stand establishment

4. Planting geometry – competition – types of competition, intra and inter plant competition – plant population – effect of plant population on growth and yield – optimum plant density and planting pattern

5. Soil fertility – soil fertility and soil productivity – fertility losses – maintenance of soil fertility – soil organic matter

6. Weed control – definition of weed – losses and uses of weeds – weed influence on crop production – methods of wed control

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**UNIT – III: (6Hrs.)**

1. Irrigation management – importance of irrigation – objectives of irrigation – methods of irrigation – drainage and its advantages

2. Cropping systems – monocropping – definition and principles of crop rotation – mixed cropping – intercropping – relay cropping – multistoried cropping – sole cropping and sequence cropping

3. Harvest maturity symptoms and harvesting of major agricultural crops – rice, maize, groundnut, sugarcane and pulses – maturity indices, method of harvesting, threshing and winnowing – harvest index

4. Introduction - weed definition - harmful and beneficial effects of weeds

5. Classification of weeds – classification based on morphology – life cycle – habitat – origin – association – special features and soil pH with examples.

6. Propagation of weeds – sexual – asexual – vegetative reproduction – dispersal of weed seeds and fruits – dispersal agents – wind and water – animal – man – manures –farm implements and silage – dispersal of vegetative propagules

**UNIT – IV: (6Hrs.)**

1. Weed Biology – characteristic features of weeds – weed ecology – definition – persistence of weeds climatic – edaphic and biotic factors – crop weed association with some important crops like rice, maize, wheat, jowar, pulses, groundnut, sugarcane, cotton and tobacco.

2. Crop -weed competition - principles – factors - critical period of crop-weed competition - allelopathy.

3. Methods of weed management – preventive weed control measures – physical / mechanical, cultural,

4. Chemical and biological methods of weed control – bioherbicides - integrated weed management

5. Herbicides – definition - advantages and limitations of herbicide usage in India- classification of herbicides based on chemical nature - time and method of application

6. Classes of herbicides based on – selectivity – spectrum – translocation – residual nature – soil sterilants and fumigants – types of formulations.

7. Nomenclature of herbicides - commonly available herbicides in India – adjuvants -definition, their use in herbicides application. - surfactants - stabilizing agents - solvents - humificants - stickers - activators - compatibility agents - drift control agents etc.

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**UNIT – V: (6Hrs.)**

1. Mode of action of herbicides – important biochemical modes of action of herbicides inter fearing with photosynthetic reactions – respiration –enzymatic inhibition etc – effects of sub lethal doses of herbicides on plants

2. Selectivity of herbicides – fundamental principles of selectivity – differential rate of absorption - differences in morphology and growth habit of plants – rate of translocation.

3. Selectivity of herbicides – differential rate of deactivation of herbicides – metabolism – reverse metabolism – conjugation – protoplasmic resistance to the specific herbicide

4. Weed management in different crops and cropping systems – rice – nursery – upland rice – low land rice – wheat – sorghum – maize – red gram – black gram – groundnut – sunflower.

5. Weed management in different crops and cropping systems – sugarcane – cotton – tobacco, Vegetables (tomato, onion, chilli and brinjal) and Orchards (mango, banana and citrus).

6. Our Journey in Agriculture and Vision for the Future

7. Traditional and Technically knowledge of agricultural crops

**References Text Books:**

1. Yellamanda Reddy, T. and Sankara Reddy, G.H. 2010. Principles of Agronomy.Kalyani Publishers*,* Ludhiana*.*
2. Crafts, A.S. and Robbins, W.W. 1973. Weed Control. *Tata McGraw-Hill Publishing Co. Ltd*.,New Delhi.
3. Gupta, O.P. 1984. Scientific Weed Management. Today and Tomorrow Printers and Publishers, New Delhi.
4. Gupta, O.P. 2004. Modern Weed Management. Agro Bios (India), Jodhpur.

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