B.SC. AGRICULTURE
SYLLABUS
(Common Core Syllabus under CBCS)

With effect from the academic year 2025-2026 and onwards

Accredited with A^+ by NAAC

DEPARTMENT OF BOTANY
KAKATIYA UNIVERSITY
WARANGAL – 506 009, TELANGANA

KAKATIYA UNIVERSITY, WARANGAL

The combination of the course is Botany, Chemistry, and Agriculture

AGRICULTURE COURSE STRUCTURE w.e.f from 2025-26

CODE	PAPER TITLE	Course Type	HPW	Credits
FIRSTYEAR	**SEMESTER – I**			
AG 104	PAPER-I: Crop Production -Principles and Practices	DSC-1A	4T+2P=6	4+1=5
FIRST YEAR	**SEMESTER - II**			
AG 204	PAPER-II: Production technology of major Agricultural and Horticultural crops	DSC-1B	4T+2P=6	4+1=5
SECOND YEAR	**SEMESTER - III**			
301	SEC-1:	SEC-1	2	2
302	SEC-2:	SEC-2	2	2
AG 304	II: Crop Improvement-Plant breeding and Agricultural Biotechnology	DSC-1C	4T+2P=6	4+1=5
SECOND YEAR	**SEMESTER - IV**			
401	SEC-3:	SEC-3	2	2
402	SEC-4:	SEC-4	2	2
AG 404	**PAPER-IV:** Crop Protection I-Entomology	DSC-1D	4T+2P=6	4+1=5
THIRD YEAR	**SEMESTER - V**			
501	GE-1:	GE-1	4T	4
AG 502	**PAPER-V:** Crop Protection II - Plant Pathology	DSC-1E	4T+2P=6	4+1=5
THIRD YEAR	**SEMESTER – VI**			
AG 601	**PAPER-VI:** Agricultural Economics and Extension Education	DSC-1F	4T+2P=6	4+1=5

Theory: University Exam: 80 marks + internal:20 Marks = 80+20 = 100 = 4 credits
Practical: 25 marks = 1 credit

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w.e.f. from 2025-2026

COURSE NAME	B.SC (Botany, Chemistry, Agriculture)	SUBJECT NAME: **Agriculture**		Marks	**80**
Semester	I	TITLE	**Crop Production- Principles and Practices**	No. of Credits	**04**

UNIT-I

1. **Definition of Agriculture** - Meaning and Scope of Agronomy.
2. **Agro climatic zones** of India and Telangana. Soils, land use pattern, major sources of irrigation and ground water potential.
3. **Tillage and tilth-** Objectives of tillage –characteristic of ideal seed bed-Effect of tillage on soil properties- pore space, structure bulk density, particle density and colour of the soil.
4. **Types of tillage-preparatory tillage-** factors effecting preparatory cultivation, after cultivation, puddling

UNIT - II

1. **Crop Stand establishment** - Factors effecting optimum stand establishment-Study of seeding equipment & methods of sowing in the field.
2. **Crop density** - 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-
3. **Growth and development of crops** - factors effecting growth and development, **Weed Control**-Definition and Principles of crop rotation cropping-
4. **Silviculture** - Definition and Objectives, Parts and stages of development of a tree, plantation life history of tree cultivation.

Agroforestry- definitions-importance-criteria of selection of trees in agroforestry.

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UNIT-III

1. **Soil fertility**- soil fertility and soil productivity-fertility losses- maintenance of soil fertility-soil organic matter-uses of organic matter.
2. **Crop nutrition**-Essential elements-Importance of major, secondary and micronutrients.
3. **Manures and fertilizers**- Classification- Nutrient content- Nutrient use efficiency-Factors effecting nutrient use efficiency.
4. **Soil classification** - maintenance of soil productivity, water management-water harvesting- storage-distribution and relevance to modern agriculture-Quality of irrigation water- Salinity hazard, Sodicity hazard, Residual sodium carbonate and Boron toxicity-Criteria and threshold limits-Management practices for using poor quality water.

UNIT -IV

1. **Soil-water relations** –Physical properties of soil-Effective root zone depth-Moisture extraction pattern-Moisture sensitive periods of important crops-Irrigation management –importance of irrigation-Objective of –methods of irrigation-drainage and its advantage.
2. **Kinds of water in soil**-Gravitational Water- Capillary water-Hygroscopic water-Soil moisture constants- Saturation capcity –Field capacity-Permanent wilting point-Available soil moisture-Hygroscopic coefficient-
3. **Surface irrigation methods**-Wild flooding, Check basin, Ring basin, Border strip, Furrow & Corrugations-Advantages and disadvantages.
4. **Water use efficiency (WUE)**-Crop water use and Field water use efficiency- factors influencing WUE-Micro irrigation-Sprinkler, drip irrigation method- Defination- Advantages & Disadvantages - Fertigation-Principle and scheduling in drip irrigation method. Recommended water soluble fertilizers.

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B. Sc Agriculture w.e.f. from 2025-2026

Practical' s:

1. Study of different tillage implements.
2. Study of different sowing operations in the field.
3. Identification of different tractor and bullock drawn implements.
4. Visit to puddling operations in agricultural fields and practical significance.
5. Different Fertilizer application methods.
6. Spray application of agro-chemicals in the field – methodology and practice.
7. Identification of different fertilizers and dosage calculations at field level.
8. Computation of seed rate and apacing of different crops.
9. Identification of different weed species in the field and their mode of propagation.
10. Visit to agro-forestry plantations and forest nursery.
11. Calculation of gravimetric and volumetric soil moisture percentage.
12. Computation of FC, PWP and available water in the soil.
13. Different types of soil structure and texture and soil profile studies.
14. Field visit to drip irrigated fields.
15. Visit to water harvesting structures like farm pond.

Reference Books

1. Yellamanda Reddy. T & Sankara Reddy. G. H. 2010 Priciples of Agronomy, kalyani Publishers, Ludhiana.
2. S.R.Reddy , 2000. Principles of Agronomy, Kalyani Publishers, Ludhiana.
3. B. Chandrasekharan, K.Annadurai, E. Somasundaram. 2014 Text book of Agronimy, New age international (P) Limited Publishers, Delhi.
4. Balasubramaniyand P and Palaniappan S.P.2009 Principles and Practices of Agronomy, Agribios publishers, Jodhpur.
5. Panda, S.E. 2012 Modern Concepts and advanced principles in crop production . Agribios (India) Publishers, Jodhpur.
6. Das.N.R.2009 Practical Manual on Basic Agronomy (with theory) scientific publishers n(India) , Jodhpur.

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7. Michael A M, 2006 Irrigation – Theory & Practice. Vikas Publishing House Private Ltd.
8. Misra, R.D and Ahmed , m. 1998. Manual on Irrigation Agronomy. Oxford and IBH Publishing Co., Ltd., New Delhi.
9. Reddy, S.R. 2007. Irrigation Agronomy, Kalyani Publishers, Ludhiana.
10. Reddy, G.H.S and Reddy, T.Y 2006 Efficient Use of Irrigation Water, Kalyani Publiushers, Ludhiana.
11. Forestry- Principles & Applications – Anthony Joseph Ray & S.B. Lal. 2013. Scientific Publishers, Jodhpur.
12. Nursery & Plantation Practices in Forestry – Vinod Kumar .2011. Scientific Publishers, Jodhpur.
13. Principles of Agricultural Engineering – Vol II. By Michael AM and Ojha TP 1993. Jain Brothers, New Delhi.

Agriculture Paper-I
(Crop Production - Principles and Practices)
Practical Model Paper

Time:2 hours | Max. Marks: 25

I.	Major experiment	6M
II.	Minor experiment -1	4M
III.	Minor experiment -2	4M
IV.	Spotters	3x2=6M
V.	Field visit/observations	2M
VI.	Record	3M

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R-23 Syllabus *w.e.f. from 2025-26 Academic year*

KAKATIYA UNIVERSITY
Department of BOTANY

COURSE NAME	B.SC (Botany, Chemistry, Agriculture)	SUBJECT NAME: **Agriculture**		Max. Marks	**80**
Semester	**II**	TITLE	**Production technology of major Agricultural and Horticultural crops**	No. of Credits	**04**

UNIT – I

1. Introduction – origin – distribution – area – production - productivity in World, India and Telangana.
2. Sowing – planting methods – seasons – seed rate – spacing – fertilizer application – weeding - irrigation.
3. Critical growth stages – flowering – maturity – harvesting –threshing – storage – yield in Kharif crops Rice, Maize, Sorghum, Pearl millet, Redgram, Greengram, Castor, Soyabean, Sesame, Cotton.

UNIT – II

1. Origin, geographical distribution, economic importance, soil and climatic requirements, varieties,cultural practices and yield of Rabi crops.
2. **Cereal crops** –wheat and barley; **pulses**-chickpea, lentil, peas; **Oilseed crops** - mustard and sunflower; **Sugar crops**-sugarcane.
3. Medicinal and aromatic crops- lemon grass and citronella, **Forage crops** - berseem, Napier hybrid and Paragrass.

UNIT – III

1. Intercultivation and intercropping – training and pruning – flowering – pollination-fruit set – cropping – harvesting – maturity indices – yield of Mango, Banana, Citrus, Grape, Guava, Papaya and Oil palm.
2. Alternate or biennial bearing and irregular bearing, mango malformation, spongy tissue and fruit drop – causes and remedies in mango – De-suckering – wrapping of bunches – removal of male bud – removal of floral remnants in Banana - Pruning and training – flowering – bahar treatment – fruit drop – causes and control in Citrus.
3. Different methods of training – head, arbour, kniffin, and telephone trellies system – advantages and disadvantages of each system in Grape.

UNIT – IV

1. Olericulture -definition –importance of vegetables in human nutrition and national economy – types of vegetable gardens.
2. Classification of vegetables based on botany, plant part used as vegetables, life cycle, seasons of growing and method of cultivation - **Kitchen garden** - Origin, climate, soil, improved varieties, cultivation practices, such as time of sowing, transplanting, planting distance, fertilizer requirements, irrigation, weed management, harvesting, yield and **physiological disorders** of Tomato, Brinjal, Chilli, Cucurbits, Beans, Cole crops, Root crops, Tubercrops and Leafy vegetables.
3. Production technology – scientific name – family – plant parts used – origin and distribution – importance – botany –varieties – propagation – climate –soil – preparation of land – systems of planting – planting seasons – seed rate –spacing –sowing – mulching – irrigation – manuring – intercultural operations – provision of shade – intercropping – rotations – harvesting –processing – preservation of seed material in Turmeric, Ginger, Coriander and Fenugreek.

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Practicals:

1. Preparation and methods of raising rice nursery - Study of methods of transplanting
2. Field preparation and sowing of *kharif* &*rabi* crops (Maize, cotton, pigeon pea, etc.)
3. Recording bio-metric observations of the standing *kharif* crops&*rabi* crops
4. Study of yield contributing characters of *kharif* crops
5. Visit to research centers of related crops.
6. Visit to processing units.
7. Identification and description of varieties of mango, guava, citrus and pomegranate.
8. Seed propagation-Scarification and stratification of seed
9. Physiological disorders of fruit crops.
10. Identification of different tractor and bullock drawn implements
11. Visit to fruit research stations
12. Preparation of plant bio regulators and their use
13. Direct seed sowing and transplanting of vegetable crops
14. Study of morphological characters of different vegetables
15. Study of different characteristics of different spices
16. Visit to commercial vegetable fields

Reference books

a. Rajendra Prasad. 2017. Text book of field crops production – Food grain crops Vo. I. ICAR, New Delhi.
b. Rajendra Prasad. 2017. Text book of field crops production – Commercial crops Vo. II. ICAR, New Delhi.
c. Reddy S. R. 2004. Agronomy of field crops. Kalyani publishers, Ludhiana.
d. Jeswani L. M. and Baldev B. 1990. Advances in pulse production technology. ICAR, New Delhi.
e. Vegetable Crops in India, Bose, T.K. and Som, T.K.1986.
f. Production Technology of Vegetable Crops-Shanmugavelu,K.G.1985.
g. Fruits-Tropical and sub-tropical -Bose T.K. and Mitra.S.K,1990. Kalyani Publishers, Ludhiana
h. Introduction to spices, plantation crops, medicinal and aromatic plants. Oxford Publications, New Delhi.

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Agriculture Paper-II
(Production Technology of major Agricultural and Horticultural crops)
Practical Model Paper

Time:2 hours | Max Marks:25

I.	Major experiment	6M
II.	Minor experiment -1	4M
III.	Minor experiment -2	4M
IV.	Spotters	3x2=6M
V.	Field visit/observations	2M
VI.	Record	3M

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