INSTITUTE	**FACULTY OF AGRICULTURE**
PROGRAM	**BACHELOR OF SCIENCE (Hons.) AGRICULTURE**
SEMESTER	**5**
COURSE TITLE	**CROP IMPROVEMENT - I (KHARIF CROPS)**
COURSE CODE	**16AS0509**
COURSE CREDITS	**2**

Objective:

1 To impart knowledge to the students on botany, origin, distribution and various breeding approaches used for the development of varieties/hybrids in kharif crops.

2 To provide the knowledge regarding hybrid seed production in various kharif crops.

Course Outcomes: After completion of this course, student will be able to:

1 Students will be able to know the biodiversity pattern in Kharif crops.

2 Students will acquire the knowledge about importance of genetic resources in crop improvement of Kharif crops.

3 Students will gain the knowledge of germplasm conservation, utilization and genetics of qualitative and quantitative characters and their inheritance.

4 Students will be able to analyze the breeding procedures and methods, breeding objectives in different Kharif crops for the development of improved varieties/ hybrids.

Pre-requisite of course: Students will learn various breeding techniques for improvement of kharif crops.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
1	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**1** Breeding of Rice, Maize, Sorghum, pearl millet	2
2	**2** Breeding of Pigeon pea, Mung bean, Soybean	2
3	**3** Breeding of Groundnut , Sesame and Castor	2
4	**4** Breeding of Cotton, Okra and Tobacco	3
5	**5** Breeding of Bottle gourd, Bitter gourd, Ridge gourd, Sponge gourd and Cucumber	4

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Contents : Unit	Topics	Contact Hours
6	**6** Ideotype concepts and various international, national and state level research station and varieties/ hybrids released.	2
Total Hours		**15**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**1** Emasculation and hybridization techniques rice, maize, sorghum, pearl millet	2
2	**2** Emasculation and hybridization techniques in pigeonpea and mungbean	2
3	**3** Emasculation and hybridization techniques in soybean, groundnut, seasame, castor, cotton	2
4	**4** Emasculation and hybridization techniques in tobacco and okra	2
5	**5** Emasculation and hybridization techniques in bottle gourd, bitter gourd, ridge gourd, smooth gourd and cucumber	2
6	**6** Maintenance breeding of different kharif crops	2
7	**7** Detailed procedure of hybrid seed production of maize, pearl millet and cotton and castor etc	2
8	**8** Visit to seed production plots and submission of report	2
9	**9** Visit to AICRP plots of different field crops	2
10	**10** submission of visit report	2
Total Hours		**20**

Textbook :

1 NA, NA, NA, NA

References:

1 Plant Breeding: Principles and Methods, Plant Breeding: Principles and Methods, Singh, B.D, Kalyani Publishers, 1983

2 Essentials of Plant Breeding, Essentials of Plant Breeding, Phundan Singh, Kalyani Publishers, 1996

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References:

3 Breeding of Horticultural Crops – Principles and Practice, Breeding of Horticultural Crops – Principles and Practice, Kumar, N., New India Publishing Agency, 2006

4 Principles and Practice of Plant Breeding, Principles and Practice of Plant Breeding, Sharma, J.R., Tata McGraw Hill Publishing, 1994

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
25.00	25.00	20.00	10.00	10.00	10.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board may also use any of tools such as demonstration, role play, quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the class-room.

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

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