Shri Guru Ram Rai University

(Estd. By Govt. of Uttarakhand, vide Shri Guru Ram Rai University Act No. 03 of 2017 Act No. 03 of July 2017)
New Campus Pathribagh, Dehradun-248001,Uttarakhand.
Department of Seed Science & Technology, School of Agricultural Sciences

M.Sc. AGRICULTURE (SEED SCIENCE AND TECHNOLOGY)
OUTCOME BASED EDUCATION

Programme outcome (POs)

Upon successful completion students will be able to:

PO. 1	Quality education in Agriculture with special reference to Agronomy, Soil Science, Horticulture, Entomology, Plant Pathology, Seed Science & Technology and crop improvement to the solution of Agriculture related issues.
PO. 2	Understanding of analysis of complex on and off farm problems and their solution in crop improvement on sustainable manner
PO. 3	Skills to select and apply natural resources, modern techniques and IT tools for weather forecasting, soil analysis, pest management and quality seed production of food crops.
PO. 4	The methods of experimental design, analysis of data and their presentation
PO. 5	Research based knowledge of the environment and recognizes the importance of crop biodiversity in the field to preserve agro-ecosystem
PO. 6	Analytical skills by correlating and integrating viable solution to solve problems with team spirit
PO. 7	Demonstrate and understand the impact of globalization and diversification of agriculture. extension programmes to disseminate modern technologies for farmer's welfare
PO. 8	Farm management skills for improvement of socioeconomic condition of farmers
PO. 9	The Skills to recognize and evaluate the relationships between input and outputs, cost: benefit ratio in their agricultural field to make effective decision .The programme will enhance job opportunities and entrepreneurship development
PO. 10	Self-critical opinion to solve the on farm problems on sustainable basis. The students will generate a culture of lifelong learning in an inclined environment to get personal achievement and professional ethics

PO. 11	Know the recent development, future possibilities in agriculture sector. Provide comprehensive knowledge of agriculture production.
PO. 12	The students will generate a culture of lifelong learning in an inclined environment to get personal achievements and professional ethics.

Programme specific outcome (PSOs)

PSO. 1	To develop the skills of modern concepts in seeds production
PSO. 2	To educate and explain the various management strategies to enhance pollination, seed processing and storage
PSO. 3	To disseminate modern techniques to prevent seed quality loss due to biotic and abiotic factors
PSO. 4	Solve the practical based experimental problems of seed production and testing. , use of equipments and laboratory use along with data collection and their interpretation.
PSO. 5	Predict and solve the legal issues related to seeds production and processing
PSO. 6	Design and apply a seed processing and testing plan

Course Outcomes

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-501**	**Credit**	**3(2+1)**
Year/Sem	**1/I**	**L-T-P**	**2-0-1**
Course Name	**Floral biology, seed development and maturation**		
Course Outcomes	CO1. Memories importance of seed and its botany CO2. To get skill for differentiate the botanical development of monocot and dicot seeds CO 3. Summarise seed development and maturation of various crop plants CO 4. Examine pollination behavior and reproduction process in flowering plants CO 5. To understand and explain accumulation pattern of food reserves in seeds CO 6. Able to understand and evaluate the application of apomixes, polyembryony		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	-	2	-	2	-	p	-	-	1	1	2	2	2
CO2	1	2	2	2	2	2	1	2	2	2	2	2	2	2
CO3	2	2	2	2	2	2	2	1	3	2	1	1	1	3
CO4	2	3	3	3	3	2	2	3	3	3	1	2	2	2
CO5	1	2	2	2	2	2	2	1	3	2	2	1	2	2
CO6	1	2	2	2	1	3	1	2	2	2	1	1	2	2
Average	1.5	2.2	2.16	2.2	2	1.83	1.3	1.8	2.16	2	1.33	1.5	1.83	2.16

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-502**	**Credit**	**4 (3+1)**
Year/Sem	**1/I**	**L-T-P**	**3-0-1**
Course Name	**Statistical Methods and Experimental Designs**		
Course Outcomes	CO 1. To understand the meaning and use of center of deviation CO 2. Define the basic concept of statistics, t-test, f-test, hypothesis, sampling etc. CO 3. To understand the statistical methods use in research experiments. CO 4. Able to apply and prepare experimental designs. CO 5. Able to collect and analyze the experimental data CO 6. Able to make statistical calculations and their validation		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	2	2	2	2	2	2	2	2	2	1	1	2	3
CO2	2	3	3	3	3	3	3	2	3	2	2	2	2	2
CO3	2	2	2	3	2	2	2	2	2	1	1	2	2	3
CO4	2	3	3	3	2	3	2	2	2	2	2	2	3	3
CO5	2	2	1	3	2	1	3	2	1	2	2	3	3	2
CO6	2	1	2	1	3	2	2	1	2	2	2	2	2	2
Average	2	2.16	2.16	2.5	2.33	2.16	2.33	1.83	2	1.83	1.66	2	2.33	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-503**	**Credit**	**3 (2+1)**
Year/Sem	**1/I**	**L-T-P**	**2-0-1**
Course Name	**Seed production in field crops**		
Course Outcomes	Upon successful completion of the course student will be able to: CO 1. To outline and summarise floral biology and pollination behavior of crops. CO 2. Define principles of seed production and the importance of seed quality CO 3.To implement techniques involved in quality seed production of crop plants CO 4.Explain field and seeds standards of various crops. CO 5. Able to understand and analyse the quality of seeds CO 6. Able to conduct the field inspection		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	-	2	1	2	2	2	2	1	-	2	2	2	2
CO2	1	2	1	2	1	2	1	2	2	1	1	2	2	3
CO3	1	2	3	3	2	3	2	3	2	2	3	2	3	3
CO4	1	1	2	3	3	2	2	2	2	3	2	2	3	3
CO4	2	2	2	2	2	2	3	3	3	3	2	3	3	3
CO5	2	2	2	2	1	2	2	1	2	3	2	2	3	2
Average	1.5	1.5	2	2.16	1.83	2.16	2	2.16	2	2	2	2.16	2.66	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-504**	**Credit**	**3 (2+1)**
Year/Sem	**1/II**	**L-T-P**	**2-0-1**
Course Name	**Physiology of seeds**		
Course Outcomes	CO 1.Define physiological processes involved in seed CO 2. Relate physiological mechanism involved in dormancy and germination CO 3. Judge different climatic factors in seed aging and physiological changes CO 4. Explain and estimate seed vigour and their measurement CO 5. Able to understand the mechanism of assimilation of storage food reserve CO 6. Able to apply the methods of breaking dormancy		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	1	2	2	2	1	-	2	1	1	2	2
CO2	2	2	1	2	1	2	1	2	2	2	2	2	2	2
CO3	2	2	3	3	2	3	2	3	2	2	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	2	1	2	1	2
CO5	2	2	1	2	3	2	2	3	3	2	2	1	2	1
CO6	2	3	2	2	2	2	2	3	3	2	2	2	2	2
Average1	2	2.5	1.83	2.16	2.16	2.16	1.83	2.33	2.4	2	1.66	1.83	1.83	2

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-505**	**Credit**	**3 (2+1)**
Year/Sem	**1/II**	**L-T-P**	**2-0-1**
Course Name	**Hybrid seed production**		
Course Outcomes	CO 1.Define meaning and importance of hybrid seeds. CO 2. Outline and summarise pollination mechanism of crop plants and their relevance to hybrid seeds production		

	CO 3. To understand and utilize the heterosis CO 4. Explain hybrid seeds production techniques in different agricultural crops CO 5. Develop and use the breeding lines involved in hybrid seeds production CO 6. Able to determine the cost of hybrid seeds production

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	1	2	2	2	2	2	2	3	2	3	3
CO2	2	2	1	2	1	2	1	2	2	1	2	2	3	3
CO3	2	2	3	3	2	3	2	3	2	3	2	2	2	2
CO4	2	3	2	3	3	2	2	2	2	2	2	2	3	3
CO5	1	1	2	3	2	2	3	3	2	3	1	2	2	2
CO6	2	2	2	3	3	2	2	2	3	3	2	2	2	3
Average	1.83	1.83	2	2.5	2.16	2.16	2	2.33	2.33	2.33	2	2	2.5	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-506**	**Credit**	**3 (2+1)**
Year/Sem	**1/II**	**L-T-P**	**2-0-1**
Course Name	**Seed processing and storage**		
Course Outcomes	CO 1. To understand and prepare the seed processing and their layout CO 2. Understand and apply the basic principles and mode of action of various seed processing equipments CO 3. Prepare seed storage planand application Able to apply the seeds treatment techniques CO 4. Understand and analyze the seed cleaning and grading process and equipments CO 5. Explain factors responsible for seed deterioration during storage CO 6. Able to use techniques to minimize the storage loss		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	3	2	2	2	1	1	1	2	2	2	2
CO2	3	2	3	2	2	2	1	2	2	3	2	2	2	2
CO3	2	2	3	3	2	3	2	3	2	3	2	2	2	3
CO4	2	3	2	3	3	2	2	2	2	3	1	1	2	2
CO5	2	2	2	3	2	3	2	3	2	3	3	2	3	3
CO6	2	2	2	2	3	3	3	2	2	3	2	3	2	2
Average	2.16	2.33	2.33	2.66	2.33	2.5	2	2.16	1.83	2.66	2	2	2.16	2.33

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-508**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed production: principles and practices**		
Course Outcomes	CO 1.memorise the basic principles of seed production in varieties and hybrids of crops CO 2. Relate concept of seed quality and their significance CO3. importance of field standards and seed standards in quality seed production CO4. About seed quality control system in India CO5 Able to apply seed standard in field. CO6 able to apply field stand in seed production fields.		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	2	2	1	2	2	2	2	2	2	1	1	3	3
CO2	1	2	3	2	2	2	1	2	3	1	2	2	3	3
CO3	2	2	3	2	2	3	2	3	2	1	2	3	3	3
CO4	2	3	2	2	3	2	2	2	2	2	2	2	2	3
CO5	2	2	2	2	3	2	2	2	2	2	2	2	2	2
CO6	1	2	2	3	3	2	2	3	3	3	2	3	3	2
Average	1.66	2.16	2.33	2	2.5	2.16	1.83	2.33	2.33	1.83	1.83	2.16	2.66	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-509**	**Credit**	**3(2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed production technology of vegetable crops**		
Course Outcomes	CO 1. Define principles of vegetable seed production CO 2. categorize seed classes and industrial development of India CO3. Choose and implement seed production techniques of vegetable crops CO4. Correlate and understand the plant quarantine and quality control CO 5. Able to apply seed testing and certification techniques CO 6. Got the ability to analyze the results as per seeds standards		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	2	2	2	2	2	2	2	2	-	2	2	2	3
CO2	1	2	3	2	2	2	1	2	1	1	2	2	2	3
CO3	2	2	3	2	2	3	2	3	2	2	2	3	2	3
CO4	2	3	2	2	2	2	2	2	2	2	1	2	2	2
CO5	2	2	2	3	3	3	3	3	3	3	2	2	1	3
CO6	2	2	3	2	3	2	3	2	3	3	2	2	2	2
Average	1.83	2.16	2.5	2.166	2.33	2.33	2.16	2.33	2.166	1.83	1.83	2.16	1.83	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-510**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed health technology**		
Course Outcomes	CO 1.Memorise principles and practices of seed health. CO 2.Summarise recent advances in the establishment and subsequent cause of disease development in seed		

	CO3. Examine losses caused by seed borne diseases in true and vegetative propagated seeds. CO 4. Got the skills to test the seed health of a seeds lot CO 5. Understand and analyze the results of seed health testing CO 6. Got the skill identify and inspect the seeds field for seed borne diseases

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	2	2	2	2	2	-	-	2	2	2	2
CO2	3	2	3	2	2	2	1	2	2	1	2	2	2	2
CO3	2	2	3	3	2	3	2	3	2	2	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	3	2	2	1	2
CO5	2	3	2	2	2	1	2	2	2	3	2	2	2	1
CO6	2	2	3	3	2	3	2	3	2	2	2	3	2	3
Average	2.16	2.5	2.5	2.5	2.16	2.16	1.83	2.33	2	1.83	2	2.33	1.83	2.16

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-511**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed production in pasture forage and green manure crops**		
Course Outcomes	Co1. Identify forage, pastures and green manure seeds and their characteristics Co2. Estimate and relate pollination behavior of forage, pastures and green manure crop CO3. examine purity of seeds CO4. Illustrate seeds production techniques of forage, pastures and green manure crops CO 5. Understand and use of seed processing equipments and machines CO 6. Got the skill to test the seeds quality of pasture forage and green manure crops		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	-	1	2	2	2	2	1	2	2	2	3
CO2	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO3	2	2	3	3	2	3	2	3	2	3	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	3	2	2	2	3
CO5	2	2	3	3	2	3	2	3	2	2	2	3	2	3
CO6	1	2	2	2	2	2	1	2	2	3	2	2	3	2
Average	1.66	2.33	2.5	2.16	2	2.33	1.66	2.33	2	2.5	2	2.33	2.16	2.83

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-512**	**Credit**	**3 (3+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed entomology**		
Course Outcomes	CO 1. Identify various kinds of seeds insects CO 2. Understand classification and behaviors of insects CO3. Examine and judge the pollinators and their significance CO 4. Able to apply the insect to enhance the pollination CO 5. Estimate in methods and techniques of insects pest control CO 6. Apply the techniques to minimize the storage loss due to insects		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	-	\-	1	2	2	2	2	-	1	1	2	2
CO2	1	2	3	2	2	2	1	2	2	2	2	2	2	2
CO3	2	2	3	3	2	3	2	3	2	2	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	2	1	2	1	2
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	2	3	2	3	2	3
Average	1.66	2.33	2.8	2.16	2	2.33	1.66	2.33	2	2.4	1.66	2.16	1.83	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-513**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed marketing and management**		
Course Outcomes	CO 1. Outline and highlight basic principles of seed marketing CO 2. Compare of seed supply system of India and worldwide CO3. Choose different seeds policies and organization involved in seeds marketing CO4. Structuring business and requirements to establish business CO 5. Able to apply procedure as per seed legislation CO 6. Analyze the impact of business plan		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	1	1	1	2	2	1	1	2	3	3	2	2
CO2	1	2	3	2	2	2	1	2	2	1	2	2	2	2
CO3	2	2	3	3	2	3	2	2	2	2	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	2	2	2	2	2
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	2
CO6	2	2	3	3	2	3	2	3	2	3	2	3	2	2
Average	1.66	2.33	2.5	2.33	2	2.33	1.66	2	1.83	2.16	2.16	2.5	2	2.16

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-514**	**Credit**	**3 (2+1)**
Year/Sem	**1/I**	**L-T-P**	**2-0-1**
Course Name	**Emerging trends in seed quality enhancement**		
Course Outcomes	CO 1. Memories basic concept of seed quality CO 2. Express physical, physiological and biochemical seed enhancement		

	techniques CO 3.Determine the factors which affect the seed quality CO4. Explain the techniques like synthetic seeds, seed coating and pelleting CO 5. Able to apply artificial storage techniques CO 6. Able to develop coated and pelleted seeds

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	1	1	2	2	1	-	-	3	3	2	2
CO2	2	2	2	3	2	2	2	2	2	1	2	2	2	2
CO3	2	2	3	3	2	3	2	2	2	2	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	2	2	2	2	3
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	2	2	2	2	2	3	2	3	2	3	2	3
Average	1.83	2.33	2.33	2.33	2	2.16	1.83	2	2	2.2	2.16	2.5	2	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-515**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Testing for genuineness and purity of cultivars**		
Course Outcomes	CO 1.Understandphysical and genetic purity of the cultivars. CO 2. Choose and execute methods used to check cultivar purity in field CO3.Examine cultivar purity through biochemical testsCO 4. Understand and analyze the marker based cultivar purity test CO 5. Able to test and categories the purity of cultivar by computer based machine vision CO 6. Analyze, interpretation and documentation of results of cultivar purity		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	1	1	1	2	2	1	-	-	2	2	2	3
CO2	2	2	2	3	2	2	2	2	2	1	2	2	2	3
CO3	2	2	3	3	2	3	2	2	2	2	2	3	2	2
CO4	2	3	2	3	3	2	2	2	2	2	2	2	1	3
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	2
CO6	2	2	3	3	2	3	2	3	3	2	2	2	2	2
Average	1.83	2.33	2.33	2.5	2	2.33	1.83	1.83	2.2	2	2	2.16	1.83	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-516**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**In-situ and ex-situ conservation of germplasm**		
Course Outcomes	CO 1. Define and highlight basic concept germplasm conservation CO 2. Understand and apply the In situ and ex situ conservation techniques CO 3. Relate multiplication of germplasm CO 4. Examine application of cryopreservation in agriculture, horticulture and forestry crops CO 5. Categorize in vitro conservation techniques of germplasm CO 6. Analyze the in vitro conservation data and their utilization		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	\2	3	2	2	2	2	2	3	3	3	3
CO2	2	2	2	3	2	2	2	2	2	2	2	2	2	2
CO3	2	2	3	3	2	3	2	2	3	3	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	3	2	2	3	2
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	3	3	2	3	2	3
Average	1.83	2.33	2.5	2.66	2.33	2.33	1.83	2.33	2.33	2.66	2.16	2.5	2.33	2.66

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-517**	**Credit**	**2 (2+0)**
Year/Sem		**L-T-P**	**2-0-0**
Course Name	**Plant quarantine**		
Course Outcomes	CO 1. Define the concept and importance of plant quarantine CO 2. Relate the economic significance of plant quarantine. CO3. Identify the insect-pest affected germplasm CO 4. Understand and utilization of New policy on seed development in India CO 5.Correlate Export & import plant quarantine. CO 6. Choose and apply the plant quarantine techniques		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	\-	3	2	2	2	-	--	2	2	3	2
CO2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO3	2	2	3	2	2	3	2	2	2	1	2	3	2	3
CO4	2	3	2	2	3	2	2	2	2	2	1	2	3	2
CO5	1	2	3	2	2	2	2	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	2	3	2	3	3	3
Average	1.83	2.33	2.5	2.2	2.33	2.33	2	2.16	2	2.2	2.2	2.33	2.5	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-518**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Planting Material and Seed Production in Flower Crops**		
Course Outcomes	CO 1. Memorize scope and importance of planting material in flower crops. CO 2. Relate Global and Indian scenario in planting material and flower		

	seed production. CO 3. Able to integrate and maintain the pollination in flower crops CO4. Demonstration of propagation techniques; Nursery management techniques. CO 5. Understand and analyze the legal work propagation CO 6. Able to produce hybrid seeds in flower crops

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	\-	3	2	2	2	-	--	2	2	2	3
CO2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
CO3	2	2	3	2	2	3	2	2	2	1	2	3	2	3
CO4	2	3	2	2	3	2	2	2	2	2	2	2	2	3
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	2	3	2	3	2	3
Average	1.83	2.33	2.5	2.2	2.33	2.33	1.83	2.16	2	2.2	2	2.33	2	3

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-519**	**Credit**	**3 (2+1)**
Year/Sem		**L-T-P**	**2-0-1**
Course Name	**Seed production and cultivation of medicinal and aromatic plants**		
Course Outcomes	CO 1. Identify and know the importance of various medicinal plant and their seeds CO 2. Understand and utilize the traditional knowledge of medicinal plants CO3. Able to apply seeds production techniques in medicinal crops CO4. Skills to maintain the genetic purity and physical purity of medicinal plants. CO 5. Got the skills to process the seeds of medicinal crops CO 6. Able conduct field inspection and report preparation		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	3	2	\2	3	2	2	2	2	2	-	2	2	2
CO2	2	2	2	3	2	2	2	2	2	2	2	2	2	2
CO3	2	2	3	3	2	3	2	2	2	3	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	3	1	2	2	2
CO5	1	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	2	3	2	3	2	3
Average	1.83	2.33	2.5	2.66	2.33	2.33	1.83	1.83	2	2.66	1.8	2.33	2	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-601**	**Credit**	**3 (2+1)**
Year/Sem	**1I/III**	**L-T-P**	**2-0-1**
Course Name	**Seed quality and testing**		
Course Outcomes	CO 1. Grasp the significance of seed quality testing CO 2. To understand and apply the seed sampling methods and equipments CO 3. Able to apply the seeds treatments techniques CO 4.Explain seed testing procedure of tolerance CO 5. Able to compare and utilize the various seed testing standards CO 6. To understand and get the skills of seeds testing for various parameters		

CO-PO/PSO Mapping

COs POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	2	2	1	2	2	2	2	2	2	2	2	2	2
CO2	1	2	3	3	2	2	1	2	3	3	2	2	2	2
CO3	2	2	3	3	2	3	2	3	2	3	2	3	2	3
CO4	2	3	2	3	3	2	2	2	2	3	1	2	1	3
CO5	2	2	3	2	2	2	1	2	2	3	2	2	2	3
CO6	2	2	3	3	2	3	2	3	2	3	2	3	2	3
Average	1.83	2.16	2.66	2.5	2.16	2.33	1.66	2.33	2.16	2.83	1.83	2.33	1.83	2.5

Programme Name	**M. Sc. Ag. (Seed Science and Technology)**	**Programe Code**	**MSC-SEEDL-1097**
Course Code	**MAST-602**	**Credit**	**3(2+1)**
Year/Sem	**II/III**	**L-T-P**	**2-0-1**
Course Name	**Seed legislation and certification**		
Course Outcomes	CO 1. To understand the seed quality and measures of quality CO 2. Define basic concept and importance of seed legislation and Certification CO 3. Understand and Comment on legal procedures related to seed quality control CO 4. Determine various seeds legislations of India and their significance CO 5. Able to utilize and apply the field inspection techniques with standards CO 6. Link with national and international organizations related to seed and their importance		

CO-PO/PSO Mapping

COs / POs/PSOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO 4
CO1	2	2	2	1	2	2	2	2	2	2	1	1	2	2
CO2	1	2	3	2	2	2	1	2	3	1	2	2	2	2
CO3	2	2	3	2	2	3	2	3	2	1	2	3	2	2
CO4	2	3	2	2	3	2	2	2	2	3	1	2	1	2
CO5	1	2	2	2	2	2	2	2	2	3	2	2	2	3
CO6	2	2	1	2	2	2	2	3	2	2	2	2	2	2
Average	1.66	2.16	2.16	1.83	2.16	2.16	1.83	2.33	2.16	2	1.66	2	1.83	2.16