NOTIFICATION

No. 210/2022 Date: 22 December, 2022

Subject : Implementation of Syllabi of Various Programmes/Courses as per Choice Based Credit System in the Faculty of Science and Technology from the Academic Session 2022-2023 Onwards.

It is notified for general information of all concerned that, the authorities of the University has accepted the syllabi of **Seed Technology** subject of B.Sc. Part-I Semester-I & Semester – II under choice based credit system which is to be implemented stagewise from the Academic Session 2022-2023 &onwards, which is appended herewith as **Appendix – A**.

Sd/-
(Dr. T. R. Deshmukh)
Registrar
Sant Gadge Baba Amravati University

Appendix – A.

Seed Technology

POs:

The students graduating with the degree B.Sc. with Seed Technology will be able to

PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO2.Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

PO3. Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO4. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO5. Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO6. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO7. Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

PSOs:

Upon completion of the programme successfully, students would be able to

1. Identify and compare major families of dicotyledons and monocotyledons.
2. Analyse seedling establishment and role of endosperm and embryo size, .
3. Explain various plant processes and functions, metabolism (chemical composition of seed, germination, pattern of water absorption, etc).
4. Understand fertilization, seed structure and texture, seed vigour, micropropagation techniques.
5. Demonstrate the experimental techniques and methods of their area of specialization in Seed Technology.

Employability Potential of the Programme:

A career in Seed Technology can be one of the most preferred careers for the science graduate. The subject seed technology, which is related to the study of agricultural plants and agricultural practices specially, seeds and technologies related to agriculture. Moreover, fungi, diseases, higher plants, growth, metabolism and the structure among different groups. Job profile in seed technology includes study of plants including agricultural plants, tillage practices, research, working with various industries, teaching, self-employment and many more fields. Seedtechnology person is able to study agricultural practices along with finding solutions to problems related to that of agricultureand forest. Seedtechnologist also deals with space travel agriculture, artificial environments, hydroponics, floriculture, apiculture, sericulture and various other interesting areas of research. Seedtechnology graduates and post graduates are required by various organizations ranging from local to multinationals to academic, teaching and research organizations and industry depending upon their nature of activities. They fit into different roles depending upon nature of work and evolve into senior position at high salaries in Govt. and Non Govt. organizations.

After graduation in seed technology, candidate can look forward to being a part of industry such as seed, pesticide, fungicide, bio fertilizer, food processing unit, pharmaceuticals etc.

The amount of diversity in the field of seed technology gives liberty to student to choose specialization as per their own interestand choice. Student can work in organization/ industry as a

I. Seed Technologist
II. Plant Breeder and farm inspector
III. Plant pathologist
IV. Farming consultant
V. Horticulturist
VI. Nursery manager
VII. Green house operator
VIII. Ecologist
IX. Environment consultant
X. Agriculture consultant
XI. Plant explorer with special skill of writing, photography, passion in expedition etc.

The numbers of professions for seed technologist are endless. More ever the applications of seed technology improve the yield and supply of food and other plant products. The knowledge of seed technology is essential for development and management of agricultural farms, parks, waste land etc. Few examples of industry with which seed technology student can work are

- Seed industry
- Seed culture laboratories
- Food industry
- Seed and germplasm bank
- Seed and Nursery companies
- Forest services
- Botanical survey of India
- Biotechnology Industries
- Oil industry
- Land management agencies
- Plant health inspection services
- National parks
- Biological supply houses
- Plant resources laboratory
- Educational institutions

The pay scale of seed technologist has views diversity ranging from 20000 to 70000 and more per month depending upon job role and organization. Salary also varies in government and private sector. One can secure a job through competitive exams in government sector such as Indian Agricultural Research Institute (IARI), Indian Institute of Seed Science, Indian Institute of Oil Seed Research, Germplasm Research Institute, forest services, biological survey of India, in teaching and research field etc.

Future Prospectus

A student offering seed technology as a subject for his/her graduation has tremendous scope for his/her progression

Seedtechnology student can opt for further study in number of esteemed institutions of national importance like IIT, IISER, ATREE, NIT, IISc, BARK, TIFR.

After graduation student can opt for M Sc in various applied subject like Plant Breeding, Seed technology, genetic engineering, plant biotechnology etc.
Can opt entrepreneur as his/her own career

- One Can make his career as administrative officer through state and union public service commission IFS, IAS, Range forest officer, drug inspector etc.
- Huge scope in research with prestigious institution like CCMB, TIFR, IIT, IISc etc.
- Student can opt teaching in KendriyaVidyalaya, NavodayaVidyalaya etc. by taking degree like B Ed or can crack National eligibility test or state eligibility test and become senior lecturer in higher education.

Syllabus Prescribed for Three Year UG Programme
Programme : B.Sc.
Semester 1
Code of the Course/Subject Title of the Course/Subject (Total Number of periods) SDT(1S) / S 72

SEED DEVELOPMENT, AND SEED PHYSIOLOGYand **INTRODUCTION TO PLANT BREEDING**

Cos

After completion of this course successfully, the students would be able to
1. Understand development, structure and physiology of seeds
2. Analyse the developmental stages in the embryogenesis of angiosperm plants.
3. Classify different modes of reproduction in angiosperms.
4. Demonstrate various factors causing flowering and seed development.
5.Apply the understanding of seed development and germination in different fields of agriculture.
6. Apply plant breeding as the tool in crop hybridization.

	Unit	Content
Unit I	1.1. Seed structures and texture, Endosperm and embryo development Immature seed and germination. 1.2 Polyembryony and Apomixis. 1.3 Development of fruit , Classification of fruits and seed. 1.4 Physiological and Harvestable maturity. 1.5 Use and limitation of laboratory techniques, Biochemical methods, electrophoresis.	12
Unit II	2.1 Major families of dicotyledons and monocotyledons 2.2 Flower structure , megasporangium , female gametophyte development 2.3 Microsporangium , male gametophyte development . 2.4 Pollination , Autogamy , Allogamy 2.5 Morphology of seeds for verity identification . Varity descriptors ; importance in varity release General Introduction to plant breeding Definition , history , nature , scope , objectives .	12
Unit III	3.1 Mode of reproduction in plants : 3.1.1 Asexual ; Parts of plants used for propagation, apomixis 3.1.2 Sexual reproduction : Structure of flower , structure of floral Parts. 3.2 Pollination : self pollination and cross pollination ; agencies for cross pollination (air , insects, water and animals) 3.3 Fertilization : Germination of pollen grain, growth of pollen tube , fusion of egg and sperm nuclei , double fertilization	12
Unit IV	4.1 Physiology of seed development allometry 4.2 Seed ripening and maturation processes. 4.3 Chemical composition of seeds, Synthesis of food reserves. 4.4 Dormancy and ecological implications, Organic dormancy,Hardseededness. 4.5 Causes of dormancy and its breakage. 4.6 Seedling establishment and role of endosperm and embryo size on seedling establishment. 4.7 Seed deterioration during storage , factors affecting physiological changes , its implications on seed quality	12
Unit V	5.1 Seed Germination , pattern of water absorption .Types of germination and seedling abnormalities in major monocot and dicot crop species, its causes. 5.2 Factors affecting germination ,its implications. 5.3 Breakdown of different seed storage products during germination 5.4 Respiratory pathways during germination, Enzymatic activities during germination. 5.5 Germination stimulators and inhibitors .	12
Unit VI	6.1 Flowering and seed production—Flowering in crop plants, its modification for hybrid seed production. 6.2 Factors affecting seed set-temperature, relative humidity, day length, wind velocity and direction, duration of flowering, anthesis, pollen viability, stigma receptivity, nutrition and irrigation. 6.3 Sterility and incompatibility Definition of sterlity, Types of sterlitycytoplasmic , genetic, cytoplasmic-genetic . 6.4 Male sterility and self incompatibility--male sterlity, its genetics. 6.5 Self incompatibility, its genetics and use in hybrid seed production 6.6 Utility of male sterility and self incompatibility in hybrid seed production.	12

	SEM ….. (Skill Enhancement Module) 1 Study the Seeds of local crop plants 1.1 Classification of fruit & seed 1.2 Study of seed germination of local crop plants (any Two) 1.3 Biological control methods against disease of local crop plant (any Two) OR 2 Study of Seed physiology of local plants 2.1 Seed dormancy of local plant 2.2Causes of seed dormancy and its breakage 2.3Seed deterioration OR 3 Pollination biology of local plants 3.1Pollination types in local agricultural plants 3.2 flowering in crop plants 3.3Sterility and incompatibility	
	COs:- After completion of skill enhancement module learner will be able to 1. Acquire knowledge of local agricultural plant seed and fruit. 2. Germination techniques for local seed plants. 3. Understand importance of biological control methods 4. Understand seed dormancy and its breakage 5. Understand the types and importance of pollination 6. Study different flower.	
	**** Activities** 1. Collection of seed and fruits of local agricultural crops 2. Conduct mechanical seeds germination experiments on local crop plants. 3. Visit seed storage and study seed deterioration 4. Visit local crop fields and study pollination in local crops	

Course Material/Learning Resources Text books:

1. The embryology of angiosperms ,Bhojwani ,S .S. and Bhatnagar, S.P.
2. Physiology of seeds Crocker,W and Barton, L .V.
3. Principles of seed science and Technology LO Copeland Business.publishingCo .,USA
4. Viability of seeds EH Roberts .
5. Germination of seeds Mayer and PoljakoffMayber .
6. Seed biology Vol. I and II . TT Kozlowski Academic Press .
7. Physiology and Biochemistry of seeds Bewley and Black .
8. Seed Technology R L Aggrawal Oxford IBH .
9. Allard ,R W .1960Principles of plant breeding John Willey and SonsINC, Newyork .
10. Chandrasekharan S N and Parthasarthy , S V.1960Cytogeneticsandplant breeding P. VardacharyandCo. Madras .
11. Choudhary H K 1971 Elementary principles of pant breeding. OxfordandIBH . Publishing Co New Delhi
12. Choudhary R C .1982. Introduction to plant breeding Oxford and IBHPublishing Co. New Delhi

Syllabus Prescribed for Three Year UG Programme:
B.Sc. Semester 1

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/handson/Activity	(No. of Periods/Week)
SDT(1S)/Seed Technology	Practical	2

By the end of the Lab/Practical Course, generally students would be able to:
1) Understand forms of morphology of different types of seeds
2) Acquire the skill of preparation of various types of test
3) Study of seed germination and moisture content
4) Acquire knowledge of slide preparation of mitotic study.

*** List of Practical/Laboratory Experiments/Activities etc.**

S.N.	
1	Morphology of dicot seeds.
2	Seedling morphology and adult plant morphology in some major Crops for identification in green house expt .
3	Phenol test in wheat and paddy.
4	Peroxidase test, 2-4D test.
5	GA test in wheat and other crops
6	Electrophoresis NaOHTest .
7	Factors affecting germination Temperature , Moisture Substratum light pattern of water absorption (starchy /protein and oil)
8	Dormancy behaviour and its release hardseed cote.
9	Quick viability test .
10	Cytological techniques for the study of chromosomes in plants.
11	Hybridization techniques
Additional activities	1. Excursion (short/long) 2. Visit to any field area to study the plant diversity and seed growing area in natural habitat. The excursion is compulsory for all students and the report of excursion should be submitted at the time of practical examination
Submission	1. Photographic herbarium of seed growing plants. 2. Tour reports or field visit report

Faculty: Science and Technology
Programme: B.Sc (Seed Technology)
Syllabus Prescribed for Three Year UG/PG Programme: B.Sc
Semester- II

Code of the Course/Subject	Title of the Course/Subject	(No. of Periods/Week)
SDT(2S)/ SEED TECHNOLOGY	PLANT BREEDING, METHODS OF CROP IMPROVEMENT AND SEED PRODUCTION	60

COs

After completion of this course successfully, the students would be able to

1. Demonstrate on understanding of seed structure and morphology.
2. Acquire knowledge of seed cultivation practices and hybridization techniques
3. Develop critical thinking on male sterility, self incompatibility, gene interaction, types of hybrids.
4. Acquire knowledge of pureline, mass and clonal selection, heterosis, etc.
5. Study of all types of mutation and plant breeding techniques, Plant introduction agencies in India and World.

	Unit	Content
Unit I	1.1 General introduction—Seed definition- differences between seed and grain, Seed as a basic input in agriculture. 1.2 Role of high quality seeds in increasing and sustaining crop production 1.3 Seed quality concept, quality control in seed production. Characteristic of sowing quality seed. Mode of reproduction in relation to seed production 1.4 Classification of crop plant inrelation to mode of reproduction and choice of methods forseed production. 1.5 Development and testing of varieties – Systemof breeding and testing of crop varieties and hybrids in self,often, and cross pollinated crops. System of release and notification of varieties for general cultivation. 1.6 Varietal purityand its maintenance—Genetic purity of varieties-concept. Life span of varieties and factors responsible for their deterioration. 1.7 Methods of maintenance of genetic purity and techniques ofmaintenance breeding.	12
Unit II	2.1 Improvement of pollination in seed production of forage legumes, tripping process and vegetables. Improvement of pollination for hybrid seed production. 2.2 Hybrid seed production—Feasibility of hybrid seed production by the use of hand emasculation and pollination, supplementary pollination detaseling- 2.3 male sterility, gametocides and self-incompatibility. 2.4 Areas of seed production—Choice of area of seed production, 2.5 Factors affecting the choice of area of seed production-soil type, climate ,nutrition and weed status, insect pest and disease incidence. 2.6 Compact area approach in seed production. Seed village concept generation system of multiplication.	12

Unit III	3.1 Genetic basis of crop improvement –Mendelian principles of inheritance of characters (Segregation , independent assortment). 3.2 Laws of probability , Gene interactions . Gene and Environment , Inheritance of quantitative traits . 3.3 Methods of plant breeding – Plant exploration, introduction and acclimatization 3.4 Exploration- Centers of origin, Centers of Genetic diversity, methods of survey , field study, agro-climatology herbarium preparation, collection of material, plant parts . 3.5 Definition of introduction acclimatization, objectives of introduction , Types of introduction (Primary and Secondary) 3.6 Plant introduction agencies in India and World. Procedure for introduction (Procurement, quarantine, evaluation) 3.7 Merits and demerits of introductions, Achievement in field crops, flowers, fruits vegetables and other plants.	12
Unit IV	4.1 Pureline selection – Definition of pureline, 4.1.1 Characters of pureline and its importance, 4.1.2 Field techniques of pureline selection, Advantages and limitations. 4.2 Clonal selection – Definition of a clone, 4.2.1 Characters of clone,Soure of clonal variation ,Importance of clonalselection, 4.2.2 Field techniques of clonal selection, Advantages and limitations, Achievement through clonal selection in some crop spp. 4.3Mass selection Definition, Procedure of mass selection ,Merits and demerits, 4.4 Differences between pureline selection, clonal selection and mass selection.	12
Unit V	5.1 Hybridization followed by selection in self pollinated crops - pollinated crops - History , definition and types of hybridization, Application and objectives Hybridization 5.2 techniques in self-pollinated crops, Heterosis in self-pollinated crops, Advantages and limitations, Handling of segregating population (Pedigree method, Bulk method mass pedigree backcross method , multiline varieties, F1 hybrids) 5.3 Hybridization procedure in cross pollinated crops –development of inbred lines, Effect of self-pollination (selfing) , 5.4 Development of single cross and double cross hybrids, Development of synthetic and composite verities , Achievement in field crops,vegetables and fruit crops.	12
Unit VI	6.1 Mutation in crop improvement—Definition of mutation, mutagen, mutant etc. 6.2 Classification of mutation (point mutation, chromosomal, somatic mutation,spontaneous and induced mutation macro and micro mutation). 6.3 Artificial induction of mutation, Mutagens (physical, chemical, radioactive isotopes) . 6.4 Mechanism of action of mutagens. Dosimetry. Procedure for mutation breeding, Significance of induced mutation in crop improvement 4.5 Achievements through induced mutations. 4.6 Generation system of seed multiplication. System and methods of production of nucleus, breeder, foundation and certified seed.	12

	SEM ….. (Skill Enhancement Module) 1 Plant breeding in local plants 1.1Techniques of cross pollination 1.2Emasculation technique 1.3Mechanical and advance methods of plant breeding OR 2 Tillage practices 2.1 Importance of tillage practices 2.2 Types of tillage practices 2.3 Role of farm manager	
	COs:- On completion of this course the students will able to 1. Understand the use and importance of plant breeding and tillage practices. 2. Develop the skill for cultivation of plants. 3. Acquire the skill ofbreeding and tillage practices.	
	**** Activities** 1. Photographic collection and preparation of e-herbarium of local agricultural plants 2. Crossingtechniques of local agricultural plants in college garden, home kitchen garden. 3. Project on local agricultural plants to be submitted at the end of session.	

Course Material/Learning Resources

1 Seed Technology- R. L. Agrawal Oxford IBH.
2 Choudhary R. C. 1982 Introduction to plant breeding oxford and IBH, Publishing co, New Delhi. Singh , B. D. 1990, Plant breeding Principles and methods kalyni publisher, New Delhi.
3 Simmmonds, N. W. 1979 , Principles of crop improvement Longman, Newyork.
4 Strickberger N W. 1985 Genetics, McMillan publishing co. Newyork.
5 Gupta , P. K. 1991, Genetics Rastogi Publication co ,Meerut.
6 Frankel, R. and Galun, E. 1977.Pollination mechanisms, Reproduction and plant Breeding, Springer-Veriag, Berlin.
7 Poehlman, J. M. and Borthakur, D 1972 Breding Asian Field Crops. 121 122 Oxford and IBH publishing co .NewDelhi.
8 Chopra, V. L. 3Year plant breeding theory and practice. Oxford and IBH publishing co .NewDelhi.
9 Agrawal , P. K. and Dadlani, M. 1990. Techniques in seed science and Technology.South Asian publisher Newdelhi.
10 Fertilizer, W. P. 1975 Ed cereal seed Technology. Food and Agriculture Organisation of United Nation,. Rome.
11 Fertilizer ,W. P. (1982) , Ed Technical guidelines for maize seed technology. Food and Agriculture Organizatin of the United Nations , Rome

Sant Gadge Baba Amravati University, Amravati

Syllabus Prescribed for Three Year UG/PG Programme
Programme: B.Sc
Semester II

Code of the Course/Subject	Title of the Course/Subject (Laboratory/Practical/practicum/handson/Activity)	(No. of Periods/Week)
SDT(2S)/ SEED TECHNOLOGY		02

COs
By the end of the Lab/Practical Course, generally students would be able to:
1) Understand forms of gene interaction, hybridization, pollination techniques
2) Acquire the skill of preparation of slides of mitosis and meiosis.
3) Classify and identify different crop seeds.
5) Acquire knowledge of seed production practices planting, weed control, rogueing, harvesting and threshing

***List of Practical /Laboratory Experiments/Activities etc.**

S.N.	**Experiments**
1.	Preparation of slides for the study of mitosis and meiosis.
2.	Hybridization techniques.
3.	Studies on segregation using mixture of coloured seeds
4.	Studies on independent assortment.
5.	Studies on gene interactions.
6.	Preparation of agro climatic maps (India and States) for soil, crops and climatic conditions
7.	Identification of different crop seeds.
8.	Seed production planning for hybrid and verities, Computation of area and seed requirements for seed production of certified class.
9.	Study of inflorescence and flower structure of self and cross pollinated crops.
10.	Study of pollination and fertilization, insect pollinators their identification, management of insect pollinators especially honey bee isolation distance.
11.	Study of seed production practices of cereals, pulses, oilseed,andfibre crops in relation to planting, weed control, rogueing, harvesting and threshing.
12.	Visit of nucleus, breeder seed plots and study of maintenance of verities.
13.	Visit of foundation and certified seed plots and study of the techniques of seed production.
Additional activities	1. Excursion (short/long) 2. Visit to any Field area to study the Seed diversity and seed growing area in agriculturefield. The excursion is compulsory for all students and the report of excursion should be submitted at the time of practical examination
Submission	1. Photographic herbarium of seed growing plants. 2. Tour reports or field visit report

Sant Gadge Baba Amravati University, Amravati

Part A Faculty: SCIENCE and TECHNOLOGY
Programme: B.Sc. (Seed Technology)
Part B
Syllabus Prescribed for three Year UG Programme: Seed Technology
GENERAL INTEREST COURSE-1
Semester 1

Code of the Course/Subject	Title of the Course/Subject	(No. of Periods/Week)
SDT(1S)/ SEED TECHNOLOGY	GIC-1 / Floriculture and apiculture	30

COs
After completing this course, the students would be able to
1. Understand techniques of floriculture and apiculture
2. Undertake project work, extracurricular activities
3. Implement professional skill, knowledge & employability skills while performing jobs.
4. Create apiculture and adapt floriculture as profession or hobby

Unit	Contents
Unit I: Floriculture 1.1 Introduction, Importance and scope of Floriculture 1.2 Plant propagation techniques: 1.2.1 Vegetative methods- Rhizome,Corm,Bulb, Sucker, Offset, Tuber, Bulbils 1.2.2 Artificial methods- Budding, Grafting, Cutting, Layering Propagating media and potting techniques. 1.3 Study of flowering annuals, biennials and perennials 1.4 Study of cultivation practices, Disease and pest management of following plants Rose, Chrysanthemum, Gladiolus,Marigold, Gaillardia and Gerbera 1.5 Importance of flower shows and exhibitions 1.6 Commercial production of Floricultural crops, Harvesting, grading, storage, packaging and marketing	15 Periods
Unit II: Apiculture 2.1 Introduction, Importance and scope of apiculture 2.2 Types of honey bees and life cycle 2.3 Precautions and maintenance for durability of honey. 2.4 Mechanism of nectar collection. 2.5 Importance of Honey, Royal gelly and wax 2.6 Advance techniques of honey collection and packaging.	15 Periods

Course Material/Learning Resources
Text books:
1. Text book of floriculture and landscaping, Anil K Singh, AnjanaSisodia
2. Objective Floriculture and Landscaping by Desh Raj
3. Introductory Ornamental Horticulture and landscape garden, Rajaneeh Singh and Bijendrakumarsingh
4. Floriculture in India, G S Randhava and A. Mukhopadhya
5. Floriculture, Landscaping and Turf Management by AlagarsamyNithya Devi and Alagarsamy Ramesh Kumar
6. Floriculture and Landscaping –Vol.1 by NayaUdyog and T K Bose 8. Floriculture and Landscaping at a Glance by LaxmiLalSomani
7. Text Book on Commercial Floriculture and Ornamental Horticulture with Landscape Architecture by Ashok Kumar and Abhinav Kumar
8. Laurie, Alex and Ries, Victor (2004). Floriculture- Fundamentals and Practices.Agrobios, (India), Jodhpur
9. The Books of Flowers AliceM.Coats, Chancellor Press, London.
10. Garden Flowers JoanComptn, Hamlyh publ. Gr.Ltd.London.

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Part A
Faculty: SCIENCE and TECHNOLOGY
Programme B.Sc.
Part B
Syllabus Prescribed for three Year UGProgramme: Seed Technology
GENERAL INTEREST COURSE-2
Seed Pathology
Semester- II

Code of the Course/Subject	Title of the Course/Subject	(No. of Periods/Week)
SDT(2S)/ SEED TECHNOLOGY	GIC-II / Seed Pathology	30

COs
After completion of this course, student would be able to
1. Understandseed pathological diversity of the region.
2. Understand the major seed pathogens and their symptoms in the region.
3. Understand the need for development of safe control majors for seed pathogen.
4. developlaboratory skills in testing of Seed pathogen.

Unit	**Contents**
Unit I: 1.1 History of seed pathology 1.2 Economic significance of seed borne diseases. 1.3 Seed-borne fungi, bacteria, viruses and nematodes Storage fungi and its impact on animal and human health 1.4 Mechanisms of seed transmission Entry point of seed infection 1.5 Influence of environmental factors seed borne diseases Seed crop management 1.6 Management of seed storage Seed treatment, procedures and equipment Quarantives of seed health testings Procedures of sampling for seed health testing	15 Periods
Unit II: 2.1 Methods of seed health testing 2.2 Inspection of plants beyond the seedling stage 2.3 Inoculum density of seed-borne pathogens and its relationship with disease security yield losses 2.4 Seed certification and tolerance limits of seed borne pathogens 2.5 Seed act in relation to Seed borne diseases 2.6 Ecological relationship of seed-borne micro-organisms 2.7 National and international cooperation in seed pathology	15 Periods

Course Material/Learning Resources
Suggested Readings
1. Seed Pathology Vol-I & II P. Naeergaard
2. Principals of seed Pathology Vol-I & II V.K. Agarwal&J.B.Sinclair
3. Seed Treatment K.L.Jeffs.
4. Introductory Mycology C.J.Alexopoulos
5. An introduction to fungi J.P.Srivastava
5. An introduction to fungi J.P.Srivastava
6. Systemic fungicides R.W. Marsh
7. Fungicides in plant diseases control Y.L.Nene and P.N. Thapliyal
8. An annotated list of seed borne disease Mary Noble and M.J.Richardson
9. Systemic fungicides S.C.Vyas

Syllabus Prescribed for Three Year UG Programme
Programme : B.Sc. I Semester I **Seed Technology**

PRACTICAL- I
SEED DEVELOPMENT AND SEED PHYSIOLOGY, INTRODUCTION TO PLANT BREEDING
PRACTICAL EXAMINATION

Distribution of marks

Q. No.	**Name of Question**	**Marks**
1	Identification and classification of seeds 7 (monocot and dicot seeds)	7
2	Phenol test in wheat .	7
3	Seed test (Peroxidase test , GA test) any one	7
4	Identify describe specimen A , B ,C , and D giving reasons . (Flower ,Pollination, Embryology slides or models)	8
5	Submission of visit reports .	7
6	Specimen collection and viva voce	7
7	Record book .	7
		Total Marks 50

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Syllabus Prescribed for Three Year UG Programme
Programme : B.Sc. I Semester II **Seed Technology**

PRACTICALS
PLANT BREEDING, METHODS OF CROP IMPROVEMENT AND SEED PRODUCTION

PRACTICAL EXAMINATION

Distribution of marks

Q. No.	**Name of Question**	**Marks**
1	Prepare temporary mount of squash /smear of the given material and Identify two stages	7
2	Problem based on segregation / Independent assortment Gene interaction chi-square test using coloured seeds.	7
3	Identify and describe specimens A, B, C and D giving reasons (Inflorescence, Pollination, crop seed seeds)	8
4	Identification and classification of seeds on the basis of seed production practices (any two)	7
5	Submission of visit report.	7
6	Submission of seed specimens and viva-voce	7
7	Record book .	7
		Total Marks 50

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