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Maa Shakumbhari University, Saharanpur (Uttar Pradesh) India

Pre-Ph. D. Course Work / Syllabus

Subject: Horticulture		
Specialization:		
<ul style="list-style-type: none">■ Fruit Science■ Vegetable Science■ Floriculture and Landscaping■ Medicinal & Aromatic Plants, Condiments and Spices■ Post-harvest Management and Preservation Technology		
Paper-I		
Course Code----	Course Title: Advanced studies in Horticultural Research	Theory paper
<p>Course Objectives: The main objectives of this paper are to-</p> <ol style="list-style-type: none">1. Impart comprehensive knowledge to the students on importance, scope and present scenario of horticulture in India.2. Provide advance knowledge to the students on propagation and nursery management, organic farming and INM practices used in horticultural Research.3. Acquaintance with the role of plant growth regulators and importance of protected structures in horticulture.4. Teach about processing and presentation of data and experimental designs used in horticultural experimental research work. <p>Course Outcomes: After successful completion of this course, the students are expected to-</p> <ol style="list-style-type: none">1. Appreciate the contribution of horticulture in national economy.2. A thorough understanding of propagation and nursery management, organic farming and integrated nutrient management (INM) practices used in horticultural research.3. Acquire knowledge about the roles of plant growth regulators and importance of		

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protected structures in horticulture.		
4. Understand processing and presentation of data and experimental designs used in horticultural research work.		
Credit hrs.: 6		Core Compulsory
Max. Marks: 100		Min. Passing Marks : 55
Total No. of Lectures- Tutorial (in hours per week): 03 (Theory) + 03 (Practical) = 06		

Unit	Topic	No. of Lectures (Total sum=60)
I	Introduction and contribution of horticulture in national economy.	6
	Soil and climatic requirement of Horticultural crops	6
II	Propagation, Mode of propagation, seed, types seeds, dormancy and germination process of seed, factors affecting seed germination, asexual propagation methods (cutting, layering, budding, grafting, micro propagation), scion and root stock. Advantages and disadvantages of sexual and asexual propagation methods.	6
	Nursery, types and scope of nursery, nursery raising and management.	6
III	Natural and organic cultivation: – Vegetable production under organic techniques – Fruit production under organic techniques – Flower and nursery management through organic techniques – Medicinal & Aromatic Plants, condiments and spices production under organic Techniques	6
	Need and present status of organic farming in India, objectives of organic farming, national programme for organic production, principles and features of organic farming, organic farming in horticulture.	6
IV	Soil fertility and nutrient management	6
	Integrated nutrient management, principles of integrated nutrient management, components of integrated nutrient management (Chemical fertilizers, organic manures, green manures, legumes crops, crops residues and bio-fertilizers) Time and methods of manures and fertilizers application, foliar application and its concept, soil fertility evaluation.	6

	Integrated weed management.	
V	Role of plant growth regulators in horticultural crops. Plants protection measures, Integrated Pest Management. Protected cultivation:	6
	Types of protected structure, Methods used to control environment in protected structures	6

OR

■ **Post-harvest Management and Preservation Technology**

Course Code----	Course Title: Post-harvest Management and Preservation Technology	Theory paper
<p>Course Objectives: The main objectives of this paper are to-</p> <ol style="list-style-type: none"> 1. Facilitate deeper understanding of principles and practices used in postharvest management of horticultural crops. 2. Acquaint the student with proper handling and management technologies of horticultural crops for minimizing the post-harvest losses. <p>Course Outcomes: After successful completion of this course, the students are expected to-</p> <ol style="list-style-type: none"> 1. Appreciate the importance and scope of postharvest technology of horticultural produce in India. 2. Acquire knowledge about pre and postharvest treatments for extending shelf life of horticultural crops. 3. A thorough understanding of maturity indices and methods of harvesting. 4. Acquire knowledge about the value addition in loose and cut flowers. 5. Understand about storage and postharvest diseases and disorders of horticultural crops. 		
Credit hrs.: 6		Core Compulsory
Max. Marks: 100		Min. Passing Marks: 55
Total No. of Lectures- Tutorial (in hours per week): 03 (Theory) + 03 (Practical) = 06		
Unit	Topic	No. of Lectures (Total sum=60)
I	Importance and scope of post-harvest management of	6

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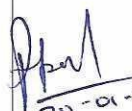
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	horticulture crops. Pre and Post-harvest factors related to post- harvest deterioration of horticulture crops	6
II	Maturity indices for harvesting, Time and methods of harvesting Hastening and delaying ripening process in fruits.	6 6
III	Physiological and biological changes occur during and after maturity in horticultural crops Pre- and post-harvest treatment of horticultural crops	6 6
IV	Treatments prior to shipment, viz., chlorination, waxing, chemicals, bio-control agents and natural plant products. Value addition in loose and cut flowers	6
V	Types of storage: Traditional structures (Low-cost structures), Zero energy cool chamber (ZECC), Cold storage (Refrigerated storage), Hypobaric storage, Controlled atmospheric storage (CAS) and modified atmospheric storage (MAS). Post-harvest diseases and disorders of major fruit and vegetable crops viz., apple, mango, guava, banana, ber, pomegranate, okra, brinjal, cauliflower, potato and tomato as well as flowers-rose, carnation, marigold, gladiolus and gerbera.	6 6


Teaching-Learning Process:

1. Class room lectures by using ICT tools (Black board / White board / Projector / Smart LED / demonstration)
2. Assignment (written and speaking)
3. Student presentation
4. Field visit / Laboratory visit
5. Group discussion


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Rakesh Kumar Singh


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Arun Kumar


Vijay Kumar


Manoj Kumar

Paper- II

Course Code----	Course Title: Assignment / Short project	Theory paper
Credit hrs. : 6	Core Compulsory	
Max. Marks: 100	Min. Passing Marks : 55	
Total No. of Lectures-Tutorial (in hours per week): 02 (Theory) + 04 (Practical) = 06		
<p>Course Objectives: The main objectives of this paper are to-</p> <ol style="list-style-type: none">1. Understand some basics concepts of research and its methodologies.2. Organize and conduct research in a more appropriate manner.3. Write a research report, synopsis and thesis.4. Present the topics in well-structured manner through PPTs. <p>Course Outcomes: After successful completion of this course, the students are expected to-</p> <ol style="list-style-type: none">1. Appreciate the importance and applications of precise techniques for completing research projects.2. Acquire knowledge about compiling data and review of literature and bibliography.3. A thorough understanding the importance of review of literature in research work.4. Acquire knowledge about the preparation of projects programmes, synopsis, manuscripts, project reports and theses.5. Practice of systematic collection and compiling of references, review of literature and different components of thesis and synopsis and precise writing.		
Unit	Topics	No. of Lectures (Total sum= 60)
I	Thesis writing: Different components of thesis and synopsis,	6
	Concept of literature review, Objectives and importance of literature review, Methods / Steps in review of literature, Types of literature view, Sources of literature.	6
II	Bibliography and references of the reviewed items (Books, Journals articles, reports and documents, Working papers, Case studies, Monographs,...) etc.	6 6
III	Identification of crops and associated weeds	6
IV	Numerical exercises on plant population, Seed rate, yields estimation, Germination, Fertilizer / manure requirement, nutrient uptake and use efficiency, Herbicide dose and weed control indices, Irrigation requirement of different crops and irrigation efficiencies.	6
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V	Power point presentation and submission of manuscript	6
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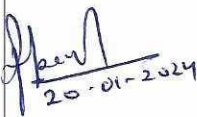
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Teaching Learning Process:


1. Class room lectures by using ICT tools (Black board / White board / Projector / Smart LED / demonstration)
2. Assignment (written and speaking)
3. Student presentation and Group discussion.
4. Field/Laboratory visit and practice of data collection



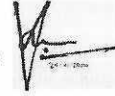
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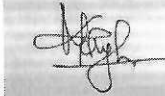
Rakesh Kumar Singh



Arun Kumar



Vijay Kumar




Manoj Kumar

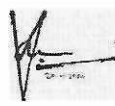
Paper- III

Course Code----		Course Title: Research Methodology	Theory paper
Credit hrs. : 4		Core Compulsory	
Max. Marks: 100		Min. Passing Marks : 55	
i. Use of Computer and ICT in Research			
ii. Statistical designs for Research			
Units	Topics		No. of Lectures (Total sum= 40)
I	Perception and Definition of Research, Objectives and Motivations of Research, Importance of Research, Types of Research, Research Methods versus Methodology.		4
II	Process of Research, Review of Literature, Formulation of the Research Problem, Sources and Identification of a Research Problem, Status of the Research Problem, Formulation of Hypothesis, Research Design, Principles of experimental designs, CRD, RBD. LSD, SPD, Factorial Design etc.		4
III	Outlines of Synopsis, Project Proposal, Project Report Writing, Research Paper Writing, Components of Research Reports, Thesis Writing, Outlines of Thesis, Reference citing, Formats of Writing References, Bibliography, Plagiarism.		4 4 4
IV	Intellectual Property (IP), Intellectual Property Rights (IPR), Intellectual Property Law, Different fields of Intellectual Property Rights, Patents.		4
V	Publication Ethics: Definitions importance Conflicts of Interest, Publication Misconduct Definition, Concept, Problems that lead to Unethical Behavior and vice versa, Types Identification of publication misconduct, Complaints and Appeals, Violation of publication ethics, Authorship and contributorship, Predatory Publishers and Journals.		4
VI	Web Browsers, Search Engines, MS Word: Handling Graphs, Tables and charts, Formatting in Ms Word, MS Power Point: Creating Slide Show, Screen Layout and Views, Applying Design Template, MS Excel : Features, Formulas and Functions.		4
VII	Subject Classification Index, Citation, Citation Index, Impact Factor, h-index, i-10 index, INFLIBNET, Introduction to Peer Reviewed and Open Access Journals, e-Journals, e-Library.		4
VIII	Research Databases, Institute for Scientific Information (ISI) and Journal Citation Reports, Science Citation Index (SCI), Social Sciences Citation Index (SSCI), Arts and Humanities Citation Index (AHCI), Databases: UGC care list, Web of Science, Scopus.		4




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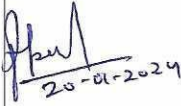

Teaching Learning Process:

1. Class room lectures by using ICT tools (Black board / White board / Projector / Smart LED / demonstration.
2. Assignment (written and speaking)
3. Student presentation and Group discussion.
4. Field and Laboratory visit

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Rakesh Kumar Singh



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