

National Education Policy 2020 Inserted Pre-Ph. D.
Course Work for

Doctor of Philosophy
in Horticulture

(Session 2022-23 onwards)



Prepared and compiled by:

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Examined by:

Board of Studies- Horticulture

Maharaja Suhel Dev State University,
Azamgarh-276 128, Uttar Pradesh (INDIA)

Course Work:

As Per Maharaja Suheldev State University, Azamgarh (U.P.), Doctor of Philosophy (Ph.D.)Degree Ordinance, 20 _____, the course work will be conducted on the following guidelines:

1. The credit assigned to the Ph.D course work shall be a minimum of 08 credits and a maximum of 16 credits.
2. The course work shall be treated as prerequisite for Ph.D preparation.
3. All candidates admitted to the Ph.D programme shall be required to complete the course prescribed by the Department during the initial one or two year.
4. Candidates already holding M.Phil. degree and admitted to the Ph.D programme, or those who have already completed the course work from any University, and have been permitted to proceed to the Ph.D in integrated course, may be exempted by the Department from the Ph.D course work. All other candidates admitted to the Ph.D programme shall be required to complete the Ph.D course work prescribed by the Department.
5. Grades in the course work, including research methodology courses shall be finalized after combined assessment by the Research Advisory Committee and the Department and the final grade shall be communicated to the Institution/College.
6. A Ph.D. scholar has to obtain a minimum of 55% of marks or its equivalent grade in the UGC 7 point scale (or an equivalent grade/CGPA in a point scale wherever grading system is followed) in the course work in order to be eligible to continue in the programme and submit the dissertation/thesis.
7. Research Advisory Committee and its functions: There shall be a Research Advisory Committee, or an equivalent body for similar purpose as defined in the Statutes/Ordinances of the Institution concerned, for each Ph.D. scholar. The Research Supervisor of the school shall be the convener of this Committee. This Committee shall have the following responsibilities.
 - I. To review the research proposed and finalize the topic of research.
 - II. To guide the research scholar to develop the study design and methodology of research and identify the course(s) that he/she may have to do.
 - III. To periodically review and assist in the progress of the research work of the research scholar.
8. A research scholar shall appear before the Research Advisory Committee once in six months to make a presentation of the progress of his/her work for evaluation and further guidance. The six monthly progress reports shall be submitted by the Research Advisory Committee to the Institution/College with a copy to the research scholar.
9. In case the progress of the research scholar is unsatisfactory, the research Advisory Committee shall record the reasons for the same and suggest corrective measures. If the research scholar fails to implement these corrective measures, the Research Advisory Committee may recommend to the Institution/College with specific reasons for cancellation of the registration of the research scholar.
10. Research Advisory Committee which may be separate for each department and shall consist of-
 - a. The Principal/Head of the institution or his Nominee as Chairman,
 - b. The Supervisor as Convener,
 - c. Two Expert nominated by the Vice-Chancellor for three years,
 - d. All the permanent faculty of the Department,

(Note- Presence of at least one expert shall be mandatory in each meeting.)

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pre-Ph. D. Course Work for Ph. D. in Horticulture

Pre-Ph. D. Course work for Ph. D. in Horticulture

The Pre-Ph. D. course work for Ph. D. In Horticulture shall comprise of only one semester (i.e., I-semester) in which there shall be three compulsory papers and one major research project.

Distribution of courses in the I Semester

I-Semester					
Course Code	Type of course	Paper	Title of the course	Max.M	Credit hr
HORT-601	Compulsory (Major Subject)	I	Advances in Production Technology of Horticultural Crops	100	6(4+2)
HORT-602	Compulsory (Major Subject)	II	Post Harvest Handling of Horticultural Crops	100	6(4+2)
HORT-603	Compulsory (Research Methodology)	III	Research Methodology for (Horticultural Sciences)	100	4(4+0)
HORT-604	Compulsory	--	Major Research Project	---	Non-credit /qualifying

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Pre-Ph. D. Course Work for Ph. D. in Horticulture

Name of the Subject: Horticulture					
Course/ paper code:	HORT-601	Course/ paper title:	Advances in Production Technology of Horticultural Crops	Credit assigned	6(4+2)
Type of course	Compulsory	Semester	I		
Course objective & Outcomes:	This Course designed with an objective to deliver Status of Horticulture, Economic value, Recent Technology of Horticulture in respect Fruits, Vegetables, flowers & Gardening learn the Technique of Assessing the worth of Projects.				
Unit	Topic (Theory)				
I	Importance, scope, current status and future prospects of horticultural industry in India. Aesthetic, economic and nutritive values of horticultural crops.				
II	Role of plant nutrients and growth regulators in horticultural production. Nursery techniques and hardening of seedlings. Pruning and training operations in horticultural crops. Pollination, fruit set, fruit drop and fruit development.				
III	Unfruitfulness, parthenocarpy and seedlessness in fruits and vegetables. Alternate bearing, causes and management. Principles underlying successful management of orchard. Selection of site and location, planning, layout and system of planting of orchard. High density orcharding.				
IV	Nutrition and kitchen garden. Top working, frame working and rejuvenation of uneconomic orchards. Principles of gardening and different feature of gardens. Important trees, shrubs, climbers, ferns, palms, bulbs, orchids, cacti and succulents, other shade and moisture loving plants. History and development of different style of gardening. Intellectual property, farmers and plant breeders' rights.				
V	Origin, history, botany, classification, distribution, area and production, export potential, climate and soil requirement, varieties, root stocks, methods of propagation, planting, nutrition, irrigation, weed management, flowering, fruiting, harvesting, disposal and management of insect, pests and diseases of: <ul style="list-style-type: none"> ➢ Mango, banana, papaya, guava, citrus and apple ➢ Tomato, brinjal, chilli, onion, cauliflower, cucumber, pointed gourd and potato ➢ Roses, gladiolus, chrysanthemum and marigold ➢ Tea and coffee ➢ Ginger and turmeric ➢ Ashwagandha, kalmegh, periwinkle and opium poppy ➢ Indian basil and mint 				
	Practical				
	<ul style="list-style-type: none"> • Propagation, Planning and Layout of orchard, Training, Pruning, Use of PGR in Horticulture, Seed bed Preparation Technique, Hardening of Seedlings, Top working, Frame working, Style of Ornamental gardening 				
Suggested readings including digital platforms	Bose TK, Mitra SK & Rathore DS. (Eds.). 1988. Temperate Fruits - Horticulture. Allied Publ. Bose TK, Mitra SK & Sanyal D. 2001. (Eds.). Fruits -Tropical and Subtropical. Naya Udyog. Chadha KL & Pareek OP. 1996. (Eds.). Advances In Horticulture, Vols. II-IV. Malhotra Publ. House. Nakasone HY & Paul RE. 1998. Tropical Fruits. CABI. Peter KV. 2008. (Ed.). Basics of Horticulture. New India Publ. Agency. Pradeepkumar T, Suma B, Jyothibhaskar & Satheesan KN. 2008. Management of Horticultural Crops. Parts I, II. New India Publ. Agency. Radha T & Mathew L. 2007. Fruit Crops. New India Publ. Agency. Singh HP, Negi JP & Samuel JC. (Eds.). 2002. Approaches for Sustainable Development of Horticulture. National Horticultural Board. Singh HP, Singh G, Samuel JC & Pathak RK. (Eds.). 2003. Precision Farming in Horticulture. NCPAH, DAC/PFDC, CISH, Lucknow.				

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Pre-Ph. D. Course Work for Ph. D. in Horticulture

Name of the Subject: Horticulture					
Course/ paper code:	HORT-602	Course/ paper title:	Post Harvest Handling of Horticultural Crops	Credit assigned	6(4+2)
Type of course	Compulsory	Semester	I		
Course objective & Outcomes:					
This course is work deals with an objective to deliver knowledge Importance and scope of post harvest handling physiology, Post Harvest changes in Horticultural Products, Technique of manipulating ripening & Storage, Hormonal & chemical control of Post Harvest deterioration of Horticulture Products learn the Technique for prolong shelf life of Horticultural Products.					
Unit	Topic (Theory)				
I	Importance and scope of post harvest handling in horticultural industry. Pre-harvest factors influencing the quality of horticultural produce. Structure of fruits in relation to edible parts, ripening, respiration, transpiration and handling susceptibility.				
II	Physiological and horticultural maturity, maturity indices, harvesting, grading and packing of fruits & vegetables. Physiological changes during development, ripening and storage of fruits and vegetables. Impact of physiological process on fruits and vegetables.				
III	Classification of fruits and vegetables on the basis respiratory behavior (climacteric and non climacteric). Techniques to manipulate ripening and senescence during storage, Re greening and De greening of fruits.				
IV	Control of spoilage during storage. Principles of disease control. Storage and its types. Post-harvest physiological disorder in fruits and vegetables				
V	Hormonal and chemical control of postharvest deterioration of fruits, vegetables & cut flowers and techniques to prolong their self life. Quarantine and export standards of horticultural crops.				
Practical					
	<ul style="list-style-type: none"> Practices of Post Harvest Management of Horticultural Products. Factor Responsible for deterioration of Harvested Fruits & Vegetables. Technique of Prolonging Shelf life of Horticultural Products. Principle and Methods of Fruits & Vegetables Preservation. Different Products of Fruits & Vegetables – Preserve , Jam, Jelly, Marmalade, Squash, Sharbat , Pickles, Sauce, Ketchup etc and RTS , Beverage. Drying and Dehydration of Fruits & Vegetables Canning & Bottling of Fruits & Vegetables Products. Freezing of Fruits & Vegetables Products. Packaging, Labeling and Costing Practices of Fruit Products. Food law & Standard. 				
Suggested readings including digital platforms		Atal CK and Kapur BM. 1982. Cultivation and utilization of medicinal plants. RRL, Jammu Bhattacharjee SK and Dee LC. 2005. Post harvest technology of flowers and ornamental plants. Pointer Publishers, Jaipur. Guenther E. The essential oils. Vol 1-6. Kumar N, Abdul Khader ML, Rangaswamy P & Ikrulappan I. 1994. Spices, Plantation Crops, Medicinal and Aromatic Plants. Rajalakshmi Publ. Masada Y.1986. Analysis of Essential Oil by Gas Chromatograph and Mass Spectrometry. John Wiley & Sons. Panda H. 2002. Medicinal Plants Cultivation and their Uses. Asia Pacific Business Press. Peter KV. (Ed.). 2001. Handbook of Herbs and Spices. Vols.I-III, Wood Head Publishing Co., UK & CRC, USA. Prajapati SS, Paero H, Sharma AK & Kumar T. 2006. A Hand book of Medicinal Plants. Agro Bios. WHO. 1998. Quality Control Methods for Medicinal Plants Materials. WHO.			

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Name of the Subject: Horticulture					
course/ paper code: type of course	HORT-603	Course/ paper title:	Research Methodology for (Horticultural Sciences))	Credit assigned	4(4+0)
Course objective & Outcomes:	Compulsory	Semester	I		
Course objective & Outcomes:		The course deals with scientific methods of research, the initiation of an inquiry, formulation of research problems and hypotheses, the role of induction and deduction in research, collection and analysis of date and interpretation of results. The course also deals with the computer applications in research and integrity in scientific conduct and research publications.			
Unit	Topic (Theory)				M. L.
I	Meaning , objective, concept and scope of research in Indian agriculture, types, criteria, process of research and characteristics of good research, selection of problem and reviewof literature, Hypothesis, their meaning and types, characterstics and testing of hypothesis, Major problems encountered in the area of agricultural research in India.				10
II	Collection, classification, tabulation and analysis of data by measures of central tendency, dispersions, coefficient of correlations and regression and different test i.e. Z, F, t and Chi square (χ^2). Interpretation of analyzed data and presentation of report and thesis.				10
III	Formulation and identification of research in Agriculture. Basic and modern concept and principles of experimental design, study about different types of experimental design i.e. CRD, RBD, LSD, Factorial design, augmented design, Split Plot Design and missingplot technique. Features of good design.				10
IV	Basic Knowledge of Computer, use of computer in the research, Data Analysis Software's andAnalysis Techniques, use of multimedia tools, use of MS Office, preparation of Power Point Presentations, use of Internet for Research Purpose, Introduction to UGC info net, INFLIBNETand ERNET etc.				10
V	Data Analysis and universal procedures for preparation of bibliography – writing of research Articles.				10
VI	Scientific conduct: Ethics with respect to science and research, intellectual honesty and research integrity, Scientific misconducts- falsifications, fabrications and plagiarism (FFP) Redundant publications: duplicate and overlapping publications, salami slicing; selective reporting and misrepresentation of data. Publication ethics: Definition, introduction and importance. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, type, violation of publication ethics, authorship and contributor ship. Software tools: use of plagiarism software like Turnitin, Urkund and other Open-source software tools.				5
Suggested readings including digital platform	1) Chandel; S.R.S. (2007). "A handbook of Agricultural Statistics" Achal Prakation Mandir, Pandu Nagar, Kanpur-208005. 2) Panse; V.G. and Sukhatme; P.V.(1967). " Statistical Methods for Agricultural Workers" 2 nd Edn. ICAR, New Delhi. 3) Rangaswami; R. (2010). " A Text Book of Agricultural Statistics"New Age Publications, New Delhi. 4) Dhondhylal SP. Social Science Research and Thesis Writing				

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1. ~~Spotted owl, the most common species found~~
2. ~~Red-tailed hawk, the most common hawk~~
3. ~~Red-shouldered hawk, the most common hawk~~
4. ~~Red-shouldered hawk, the most common hawk~~
5. ~~Red-shouldered hawk, the most common hawk~~
6. ~~Red-shouldered hawk, the most common hawk~~
7. ~~Red-shouldered hawk, the most common hawk~~

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Pre-PhD Programme in Home Science

Paper Code	Subject/Specialization	Credits	L-T-P-C	Marks		
				Sessional	End Semester	Total
	Compulsory paper I	2		40	60	100
DPH771	Research Methods and Statistics		1-1-0-2			
	Compulsory paper II	2		40	60	100
DPH772	Seminar		0-1-1-2			
	Elective paper I (Only one paper opted)	2		40	60	100
DPH773	Clothing and Comfort		1-1-0-2			
DPH774	Recent advances in Textiles and Apparel Designing		1-1-0-2			
DPH775	Public Health Nutrition		1-1-0-2			
DPH776	Advances in Food Microbiology		1-1-0-2			
DPH777	Theories of Human Development		2-0-0-2			
DPH778	Mental Health in Development Perspective		2-0-0-2			
DPH779	Community Organization		2-0-0-2			
DPH780	Development Project Manager		1-1-0-2			
DPH781	Interior Design		1-1-0-2			
DPH782	Management of Family and Organization		1-1-0-2			
	Elective paper II (Only one paper opted)	2		40	60	100
DPH783	Apparel Production and Management		1-1-0-2			
DPH784	Functional Clothing		1-1-0-2			
DPH785	Clinical and Therapeutic Nutrition		1-1-0-2			
DPH786	Advanced Human Nutrition		2-0-0-2			
DPH787	Women Studies		2-0-0-2			
DPH788	Early Childhood Care and Education		1-1-0-2			
DPH789	Development Communication		1-1-0-2			
DPH790	Media Development		1-1-0-2			
DPH791	Human Resource Management		1-1-0-2			
DPH792	Consumer Studies		1-1-0-2			
Total		8				400

The total credits of the 6 month PhD course work (Home Science) are 8.