



Savitribai Phule Pune University, Pune

(Formerly, University of Pune)

Ph.D. Coursework in Botany under

(Faculty of Science & Technology)

Revised Syllabi as per rules and regulations of SPPU Circular 07/2025

Ref number: PGS/87 dated 09/01/2025 and University Grants Commission (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022.]

**To be implemented from
Academic Year 2025-2026**

**Framed by
BOARD OF STUDIES IN BOTANY**

**Savitribai Phule Pune University,
Ganeshkhind, Pune -07.**

Structure / Syllabus of the Ph.D. Coursework in Botany under
Faculty of Science and Technology
(With Effect From Academic Year 2025-26)

Rules and regulations

[As per rules and regulations of SPPU Circular 07/2025 Ref number: PGS/87 dated 09/01/2025 and University Grants Commission (Minimum Standards and Procedures for Award of Ph.D. Degree) Regulations, 2022.]

General Guidelines:

1. The coursework is for 16 credits.
2. Contents of Course 1 and Course 3 shall be prescribed by the respective Board of Studies.
3. The recognized research center, based on the recommendations of the Research Advisory Committee, shall prescribe courses for the Ph.D. scholar, including research methodology and two subject-specific advanced courses, to be completed within two years of registration.
4. A course on Publication Ethics must be completed within two years from the date of registration by the Ph.D. scholar.
5. Candidates with an M.Phil. Degree from SPPU who are admitted to the Ph.D. program, or those who have completed M.Phil. Coursework and are permitted to proceed to a Ph.D., will be exempt from Ph.D. coursework, provided both programs are in the same subject. If the M.Phil. and Ph.D. programs are in different subjects, the candidate must complete Courses 2, 3, and 5 as specified, as per University Circular No. 07/2025 Reference Number PGS/87 dated 9th January 2025.
6. All other candidates admitted to the Ph.D. program are required to complete the coursework approved by the Academic Council of SPPU, achieving a minimum of 55% marks or its equivalent grade on the UGC 10-point scale, within the first two years of registration. Candidates will be permitted to continue with their Ph.D. studies and submit the thesis only after fulfilling these requirements.
7. Grades in the course work, including research methodology courses, shall be finalized after a combined assessment by the Research Advisory Committee and the Place of Research, and the final grades shall be communicated to the P. G. Admission Section of the SPPU.
8. All Ph.D. scholars, irrespective of discipline, shall be required to train in teaching /education /pedagogy/writing related to their chosen Ph.D. subject during their doctoral period. Ph.D. scholars may also be assigned 4-6 hours per week of teaching/research assistantship for conducting tutorial or laboratory work and evaluations.
9. The Research Advisory Committee can also recommend online/offline courses offered by UGC/National Agency/MOOCs/SWAYAM/NPTEL., etc., of 4 Credits each as part of the credit requirements for the Ph.D. program

Course-1:

Subject	Credits	No. of class hours	Syllabus	Mode of conduction or Responsibility	Recommendation and evaluation
Research Methodology	4	60	Research Methodology (7L) <ul style="list-style-type: none"> • Meaning of Research • Objectives of Research • History of research. Indian, Egyptian, Greek ideas, methodologies and research in agriculture, chemistry, metallurgy, medical. • Types of Research: Descriptive Vs Analytical Research, Applied Vs Fundamental Research, Quantitative Vs Qualitative Research, Conceptual Vs Empirical Research • Criteria for Good Research • Significance of Research • Methods and Techniques used: Library, Field and Laboratory Research • Safety in Laboratories and in field, Ethical considerations, effective verbal and non-verbal communication Defining Research Problem (3L) <ul style="list-style-type: none"> • What is a Research Problem? • Selecting the Problem • Necessity of Defining the Research Problem • Technique involved in Defining a Research Problem Research Hypothesis (7L) <ul style="list-style-type: none"> • What is Hypothesis? • Characteristics of Hypothesis 	Concerned Research Centre and research supervisor	Subject experts from various departments, research centers, and institutes will be involved in teaching and evaluating the PhD coursework in Botany. This collaborative approach ensures that students receive comprehensive and specialized knowledge from renowned experts in their fields.

			<ul style="list-style-type: none"> • Sources of Hypothesis • Types of Hypotheses: Simple Hypothesis, Complex Hypothesis, Directional Hypothesis, Non-directional Hypothesis, Null Hypothesis, Associative and Causal Hypothesis • Functions of Hypothesis • How will Hypothesis help in Scientific Method? <p>Literature Review and References (7L)</p> <ul style="list-style-type: none"> • What is Literature Review? • Purpose of Literature Review • Types of Literature Review • How to write a Review Article? • Format of Review Article • Difference between Review Articles and Research Papers • Various Referencing Styles - • Bibliometric analysis, Systematic Literature Survey, various softwares • Introduction to Meta-analysis and analysis softwares <p>Research Ethics and Intellectual Property Rights (6L)</p> <ul style="list-style-type: none"> • IPR • Patent • Copyright • Procedures for filling patent and copyright <p>Methods of Data Collection (6L)</p> <ul style="list-style-type: none"> • Collection of Primary Data • Observation Method • Interview Method 		
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			<ul style="list-style-type: none"> • Collection of Data through Questionnaires, Likert scale • Documentation of Data <p>Interpretation and Report Writing (6L)</p> <ul style="list-style-type: none"> • Meaning of Interpretation • Why Interpretation • Steps and Layout of Research Report • Mechanics of Writing a Research Abstract, Paper and Report • Oral and Poster Presentations <p>Role of Computer in Research (12L)</p> <ul style="list-style-type: none"> • Basics of Computer and introduction to Microsoft Office (MS Word, Excel, and PowerPoint), Internet • Tabulation and generation of graphs • Micro Imaging System/Digital Photography • Use of tools / techniques for Research • Scientific Search Engines for referencing the research work • Reference Management Software like Zotero /Mendeley • Software for research paper formatting like LaTeX/MS Office • Data analysis: Mean, Mode, Median, Standard Deviation, Coefficient of Variation, T-Test, Chi-square test, ANNOVA 		
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			<ul style="list-style-type: none"> • Data interpretation software - SPSS <p>Plagiarism, Impact Factor and Scientific Journals (6L)</p> <ul style="list-style-type: none"> • Software for detection of Plagiarism • Concept of Journal Citation Reports (JCR) and Journal Impact Factor (IF), • Formula for calculation of IF, • Use, significance and limitations of IF, • Concept and importance of Citations in research, • H-Index, i10-Index, • Introduction and concept of UGC CARE listed journals and Journals indexed by Thomson Reuters Scientific. 		
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Note:

- *The contact hours will be around 60 based on assignments and examinations.*
- *The examination for each module will be separately performed.*

References:

- Kothari C. R. Research Methodology (Methods and Techniques), New Age International Publishers, New Delhi
- Bill Taylor, Gautam Sinha and Taposh Ghoshal, Research Methodology, PHI Learning Private Limited, New Delhi
- Gurumani N. Research Methodology for Biological Sciences, MJP Publishers, Chennai
- Upagade Vijay and Shende Arvind, Research Methodology, S. Chand & Company Limited, New Delhi
- Suresh Chandra and Mohit Sharma, Research Methodology, Narosa Publishing House, New Delhi
- Jeff Lenburg, Guide to Research, Viva Books Private Limited, New Delhi
- R. Panneerselvam, Research Methodology, Prentice Hall of India Private Limited, New Delhi

Course-2:

Subject	Credits	No. of class hours	Syllabus	Mode of conduction or Responsibility	Recommendation and evaluation
Attending at least one Seminar/Conference/Workshop (National/International) and Presenting paper/poster	1	15	Based on the Ph.D. topic	Concerned Research Centre and research supervisor	<ul style="list-style-type: none"> It is highly desired that candidate shall present his/her research work in the Seminar/Conference/Workshop etc. (National/International) The work is to be evaluated by the concerned research supervisor

Course-3:

Subject	Credits	No. of class hours	Syllabus	Mode of conduction or Responsibility	Recommendation and evaluation
Subject specific advance level course Subject 1	04	60	Subject-1: Advances in Botany-I <ol style="list-style-type: none"> 1. Biodiversity, Conservation and Application of AI 2. Bioremediation and Restoration 3. Bioprospecting 4. Ecology, Evolution and Application of AI 5. Plants interacting with other organisms 	Concerned Research Centre	Subject experts from various departments, research centers, and institutes will be involved in teaching and evaluating course.
Subject 2	04	60	Subject-2: Advances in Botany-II <ol style="list-style-type: none"> 1. Metabolic engineering, metabolomics and Application of AI 2. Reverse genetics and its application 3. Plant genetics, breeding and Application of AI 4. Plant signaling and behavior 5. Medicinal plants, Natural product chemistry and Application of AI 		

			6. Precision Agriculture		
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Course-4:

Subject	Credits	No. of class hours	Syllabus	Mode of conduction or Responsibility	Recommendation and evaluation
Research and Publication ethics	2	30	Theory: <ul style="list-style-type: none"> • Philosophy and ethics (4L) • Scientific conduct (4L) • Publication ethics (7L) Practice: <ul style="list-style-type: none"> • Open access publishing (4L) • Publication misconduct (4L) • Data bases and research matrices (7L) 	Centre for Publication Ethics, SPPU OR Concerned Research Centre	Research Center shall conduct the UGC approved 02 credits course as per UGC letter No. D.O.F. 1-1/2018 (Journal /CARE) Dated Dec. 2019 and SPPU circular No. 65/2020 dated 3rd March 2020 OR Research Scholar can complete the Research and Publication ethics course run by the Centre of Publication Ethics SPPU.

Course-5:

Subject	Credits	No. of class hours	Syllabus	Mode of conduction or Responsibility	Recommendation and evaluation
Pedagogical Training/ Industrial Visit Report / Assessment Statement	01	30	Based on PhD topic	Concerned Research Centre and research supervisor	Pedagogical training, industrial visits, and assessments will be evaluated through presentations, reports, and exams, focusing on practical application and critical thinking.

Board of Studies (Botany)
Savitribai Phule Pune University, Pune.

Award of Credits for Ph. D. Course Work

Table -1: Percentage to grade and grade point

Sr. No.	Grade Letter	Grade Point	Marks
1	O Outstanding	10	90 to 100
2	A+ (Excellent)	9	80 to 89
3	A (Very Good)	8	75 to 79
4	B+ (Good)	7	70 to 74
5	B (Above Average)	6	65 to 69
6	C (Average)	5	60 to 64
7	D (Pass)	4	55 to 59
8	F (Fail)	0	<55
9	Ab (Absent)	0	

Table -2: Illustration of the Structure of CGPA and Marks Scheme for Ph. D. Course Work (Sample Copy)

Sr No	Course Code	Course Name	Credit	Internal marks	External marks	Grade Letter	Grade Point (0-10)	Credit Point = (Credit X Grade Point)
1	RM	Research Methodology	4	30	70	A	8	32
2	SCW	Seminar/Conference/ workshop	1	07	18	O	10	10
3	SPAL-1	Subject Specific Advanced Level Course-1	4	30	70	O	10	40
4	SPAL-2	Subject Specific Advanced Level Course-2	4	30	70	A+	9	36
5	RPE	Research and Publication Ethics	2	15	35	B+	7	14
6	PIA	Pedagogical Training/ Industrial Visit report/Assessment Statement	1	07	18	A	8	8
Total			16	112	263		52	140

CGPA = Total Credit Point / Total Credit for the Course: 8.75

Final Grade: A+ Excellent

Result: Pass

Table No.3: CGPA Distribution and corresponding class of the degree awarded

Sr. No.	CGPA	Class of the Ph. D. course awarded
1	9.50 or More than 9.5	'O' Outstanding
2	8.25 or more but less than 9.50	A+ (Excellent)
3	6.75 or more but less than 8.25	A (Very Good)
4	5.75 or more but less than 6.75	B+ (Good)
5	5.25 or more but less than 5.75	B (Above Average)
6	4.75 or more but less than 5.25	C (Average)
7	4.00 or more but less than 4.75	D (Pass)

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