



Savitribai Phule Pune University

Pune, India

Faculty of Science and Technology

Ph.D. Course Work

ENVIRONMENTAL SCIENCES

Structure and Syllabus

Effective from Academic year 2025 – 2026
vide the university circular PGS/87 dated 09/01/2025

Structure of the Ph.D. Course Work in Environmental Sciences at The Department of Environmental Sciences (SPPU) as Research Centre

1. Preamble

The Ph.D. coursework serves as a foundational and harmonizing framework for research scholars enrolled in the Ph.D. program at the Department of Environmental Sciences, Savitribai Phule Pune University (SPPU), recognized as a Research Center. Its primary objective is to bridge the academic transition from M.Sc. to Ph.D., reinforcing key M.Sc. concepts essential for advanced research. The syllabus is designed to be adaptable, allowing for specialization while laying the groundwork for addressing specific research challenges. Ultimately, the coursework aims to orient students toward producing high-quality doctoral research within the department.

Additionally, the curriculum emphasizes training in case study analysis, literature reviews, and self-assessment, focusing on emerging tools and methodologies relevant to each student's research interests.

The coursework structure adheres to the guidelines outlined in SPPU Circular No. 14/2017, subsequently revised by Circular No. 07/2025 (Ref: PGS/87 dated 09/01/2025), and aligns with the University Grants Commission's 2022 regulations on minimum standards and procedures for awarding Ph.D. degrees. The Board of Studies convened on August 14, 2025, to review and approve the syllabus, which will be implemented for new admissions starting in the academic year 2025. Students from earlier cohorts who have not yet completed their coursework will also have the option to follow this revised syllabus.

2. Regulatory Framework

As per rule 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.

The coursework is for 16 credits (please refer Table 1).

1. Contents of Course 1 and Course 3 shall be prescribed by the respective Board of Studies.
2. The recognized research center, based on the recommendations of the Research Advisory Committee, shall prescribe courses for the Ph.D. scholar, including

Table 1: Ph.D. Coursework components.

Course	Name of the Course	Credits	No. of Hours	Responsibility
1	Research Methodology	04	60	Research Center Research Supervisor
2	Attending at least one Seminar/ Conference/ Workshop (National/International) and presenting paper/poster	01	-	Research Center & research Supervisor
3	Two Subject specific advanced level courses	08	120	Research Center
4	Research and Publication ethics	02	30	Research Scholar can complete the Research and Publication ethics course run by the Centre of Publication Ethics SPPU. OR 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 3/03/2020
5	Pedagogical Training/ Industrial Visit Report / Assessment Statement	01	30	Research Center & Research Supervisor
	Total	16	240	

research methodology and **two subject-specific** advanced courses, to be completed within two years of registration.

3. A course on Publication Ethics must be completed within two years from the date of registration by the Ph.D. scholar.
4. 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 No. PGS/87 dated 09/01/2025.

5. 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.
6. 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.
7. 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.
8. 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.

3. Award of Credits for Ph. D. Course Work

Table 2: 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	nil

Table 3: Illustration of the Structure of CGPA and Marks Scheme for Ph.D. Course Work

Sr No	Course Code	Course Name	Credit	Internal marks	External marks	Grade Letter	Grade Point (0-10)	Credit Point = (Credit X Grade Point)
1	EVS_RM	Research Methodology	4	30	70	A	8	32
2	EVS_SCW	Seminar/ Conference/ workshop	1	-	-	O	10	10
3	EVS_SSAL-1	Subject Specific Advanced Level Course-1	4	30	70	O	10	40
4	EVS_SSAL-2	Subject Specific Advanced Level Course-2	4	30	70	A+	9	36
5	EVS_RPE	Research and Publication Ethics	2	15	35	B+	7	14
6	EVS_IV	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 4: 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)

4. Details of the Courses

Course 1. Research Methodology

Credits: 04

No. of hours: 60

Responsibility: Research Center and Research Supervisor

Research Methodology Course Outline*

1. **Fundamentals of Research** (4 hours)
 - Definitions and Types of research
 - Research tools and techniques
 - Hypothesis formulation, Research design and problem identification
 - Structuring a research Topic/proposal
2. **Research Objectives and Methodological Framework** (4 hours)
 - Defining research aims and objectives
 - Designing methodological approaches
 - Understanding the origin and articulation of research problems
3. **Literature Review and Research Quality Assessment** (4 hours)
 - Conducting literature surveys using search engines and digital libraries
 - Understanding plagiarism, ISSN, ISBN, impact factors, and citation indices
 - Evaluating the quality of research publications, Site score. H-Index, etc.
4. **Gap Identification in Research** (4 hours)
 - Performing in-depth literature reviews in a specific research area
 - Guided analysis under supervision to identify research gaps
5. **Sampling and Field Techniques** (8 hours)
 - Sampling methods and techniques
 - Basics of field mapping and measurements
 - Map reading, scale interpretation, toposheets, and thematic maps
6. **Emerging Technologies in Environmental and Earth Sciences** (6 hours)
 - Advances in analytical techniques
 - Integration of data science and artificial intelligence in research
7. **Research Outcomes and Database Development** (8 hours)
 - Understanding patents, products, parameters, and models
 - Exploring types of databases and contributing to them
 - Working with supervisor-recommended databases
8. **Data Types and Analytical Tools** (6 hours)
 - Differentiating primary and secondary data
 - Verifying data sources and authenticity
 - Introduction to data analysis and modelling
 - Hands-on experience with Earth science/ Environmental science software tools
9. **Scientific Writing and Data Presentation** (8 hours)
 - Techniques for data representation and statistical analysis
 - Tools for documentation and presentation
 - Structuring scientific papers, abstracts, summaries, theses, and project reports
10. **Case Study Presentation** (8 hours)
 - Presenting a research problem, methodology used, and findings
 - Commentary/Evaluation of Research paper.

- RM through documetries/films.

Course 2. Attending at least one relevant Seminar / Conference Symposium / Workshop etc.

Credit: 1 credit

No. of hours: 24+

It is highly desired that candidates shall present his/her research work in the Seminar/ Brain Storming session/ Conference / Workshop / Symposium, etc. (National/International) in podium (oral) or poster session as lead presenter/author or as corresponding author or otherwise, preferably on his approved research topic or allied / interdisciplinary field.

Responsibility: Research Center and Research Supervisor

Course 3. Two Subject specific advanced level courses

Credits: 8 credits

No. of hours: 120

Syllabus: The BOS has designed the following syllabus:

Sr. no.	Item	No of Hours	Credits
3a	Invited lectures from Prominent Scholars from Institutes/ Other Universities/ Experts on important topics such as Earth System Sciences, Environmental Sciences, Ecology, Wild life and Biodiversity, Global warming and Climate, Natural Resource Management, Biotechnology, Material and Nanoscience, Soil-water and microbiome, Biochar and applications, Energy, Pollution, Remote Sensing & GIS, Computer applications and simulation, Disaster Management, Ecotourism & Geoheritage, Instrumentation, Environmental Statistics, Environmental Law, Policy and Governance, Environmental Engineering, etc. etc. Evaluation: 1. Candidate must attend a maximum of 90% lectures (60% Marks reserved for attendance) 2. Remaining 40% marks reserved for MCQ based test conducted on the lectures organised by Research Center. Responsibility: Research Center	60	4
3b	PhD topic related assignments to be given by Research Supervisor	60	4

	Evaluation: Jointly evaluated by Research Supervisor (2 assignments) and 3 Referees (1 assignment each) (20 marks x 5 assignments) Responsibility: Research Supervisor		
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Course 4: Research & Publication Ethics*

Credits: 2 credits

No. of hours: 30

Responsibility: Research Center

Research Scholar can complete the Research and Publication ethics course run by the Center of Publication Ethics, SPPU.

OR

The Research Center shall conduct the UGC approved 02 credits course as per requirement or need (UGC letter No. D.O.F. 1-1/2018 (Journal/CARE) Dated Dec. 2019 and SPPU circular No. 65/2020 dated 3rd March 2020).

Couse content:

The Couse may contain the following component:

Modules	Unit Title	Teaching Hours
Theory		
EVS_RPE1	Philosophy and Ethics	4
EVS_RPE 2	Scientific Conduct	4
EVS_RPE 3	Publication Ethics	7
Practice		
EVS_RPE 4	Open Access Publishing	4
EVS_RPE 5	Publication Misconduct	4
EVS_RPE 6	Database and Research Metrics	7

Course 5: Pedagogical Training /Industrial Visit Report / Assessment Statement

Credits: 01 Credit

No. of hours: 30

Responsibility: Research Center & Research Supervisor

The Head of the Research Center, in consultation with the Research Advisory Committee, shall recommend suitable institutions — such as university departments, research laboratories, NGOs, voluntary organizations, industries, or mining establishments, etc., etc. — where Ph.D. scholars may undertake academic visits or work. Each scholar is expected to engage for a minimum of 30 hours and submit a detailed report for evaluation.

For pedagogical training, assessment will be based on the scholar's submitted report, field diary entries, and performance in a viva voce, reflecting their involvement in teaching and educational assignments.

*Some topics/entire RM can be offered through MOOC and Online platforms with prior intimation to BOS.
