

GURU KASHI UNIVERSITY



**Doctor of Philosophy
Agronomy
Session: 2025-26**

**Faculty of Agriculture
Guru Kashi University**

Program Structure									
Course Code	Course Title	Type of Course	L	T	P	Total Credits	Int.	Ext.	Total Marks
PPH101	Research Methodology	Core	4	0	0	4	30	70	100
PPH102	Research and Publication Ethics	Core	2	0	0	2	30	70	100
PPH104	Computer Applications in Research	Skill Based	0	0	4	2	30	70	100
PPH110	Modern concepts of Agronomy, Crop Production and Simulation Modelling, Farming Systems	Core	4	0	0	4	30	70	100
Total Numbers of Credits						12	120	280	400

Course Title: Research Methodology	L	T	P	Credits
Course Code: PPH101	4	0	0	4

TotalHours:60

LearningOutcomes

On the completion of the course the students will be able to

1. Formulate research problems by conducting comprehensive literature reviews utilizing web sources
2. Apply appropriate research design choices based on research questions and objectives.
3. Explore the integration of qualitative and quantitative data and the concept of triangulation and complementarity of data sources.
4. Utilize statistical software packages commonly used in research for importing, managing, cleaning, and analyzing data.
5. Apply different statistical techniques to summarize and analyze data effectively.

Course Content

Unit-IHours15

Introduction to Research

Meaning, Objectives, Characteristics, Significance and Types of Research. Understanding a Research Problem, Literature Review, Methods and Reporting, Selecting the Research Problem, Steps in Formulation of a Research Problem

Unit-IIHours15

Research Process and Hypothesis

Constructing Hypotheses; Conceptualizing a Research Design-Meaning and Types of Research Design. Parametric and Non-Parametric Test, Errors and Level of Significance. Completely randomized design, Random block design, Latin square design, Statistical analysis. Components of time series, Analysis of time

series, Measurement of trend, Measurement of seasonal variations.

Unit-III Hours 15

Sampling Design and Data Analysis

Sampling Techniques-Probability and Non-Probability, Qualities of a good Sample, Sample Size and its Determination.

Introduction to Qualitative, Quantitative and Mixed Methods, Quantitative Methods- Univariate, Bivariate and Multivariate, Qualitative Methods-Grounded Theory and Triangulations, Mixed Methods- Convergent Parallel, Explanatory Sequential, Exploratory Sequential and Transformative.

Implementation of statistical techniques using statistical packages viz. SPSS R including evaluation of statistical parameters and data interpretation, Regression Analysis, Covariance, analysis of variance.

Unit-IV Hours 15

Report Writing

Types of Reports- technical and Popular Reports, Significance of Report Writing, Different Steps in Writing Report, Art of Writing Research Proposals, Research Papers, Projects Reports and Thesis; Basics of Citation and Bibliography/Reference Preparation Styles; Report Presentation: Oral and Poster Presentations of Research Reports.

Suggested Reading

- Gupta, S. (2010). *Research Methodology and Statistical Techniques*. Deep & Deep Publications (P) Limited, New Delhi.
- Kothari, C.R., Garg, G. (2019). *Research Methodology: Methods and Techniques*. 4th Edition, New Age International (p) Limited. New Delhi.
- Sahay, Vinaya and Pradumna Singh (2009). *Encyclopedia of Research Methodology in Life Sciences*. Anmol Publications. New Delhi.
- Kauda J. (2012). *Research Methodology: A Project Guide for University Students*. Samfunds literature Publications.
- Dharmapalan B. (2012). *Scientific Research Methodology*. Narosa Publishing

Course Title: Research and Publication Ethics	L	T	P	Credits
Course Code: PPH102	1	0	2	2

Total Hours 30

Learning Outcomes

On the completion of the course the students will be able to

1. To have awareness about the publication ethics and publication misconducts.
2. To understand indexing and citation databases, open access publications, research metrics (citations, h-index, impact factor etc.)
3. Develop hands-on skills to identify research misconduct and predatory publications.

Course Content

RPE01: PHILOSOPHY AND ETHICS (3 Hrs.)

1. Introduction to philosophy: definition, nature and scope, concept, branches
2. Ethics: definition, moral philosophy, nature of moral judgement and reactions

RPE02: SCIENTIFIC CONDUCT (5 Hrs.)

1. Ethics with respect to science and research
2. Intellectual honesty and research integrity
3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
4. Redundant publications: duplicate and overlapping publications, salami slicing
5. Selective reporting and misrepresentation of data

RPE03: PUBLICATION ETHICS (7 Hrs.)

1. Publication ethics: definition, introduction and importance
2. Best practices/standards setting initiatives and guidelines: COPE, WAME, etc.
3. Conflicts of interest
4. Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
5. Violation of publication ethics, authorship and contribution
6. Identification of publication misconduct, complaints and appeals
7. Predatory publishers and journals

PRACTICE

RPE04: OPEN ACCESS PUBLISHING (4 Hrs.)

1. Openaccesspublicationsandinitiatives
2. SHERPA/ROMEOonline resourceto check publisher copyright & self- archiving policies
3. Software tool to identify predatory publications developed by SPPU
4. Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

RPE05: PUBLICATION MISCONDUCT (4Hrs.)

A. Group Discussions (2hrs.)

1. Subject specific ethical issues, FFP, authorship
2. Conflicts of interest
3. Complaints and appeals: examples and fraud from India and abroad

B. Software tools (2hrs.)

Use of plagiarism software like Turnitin, Urkund and other open source software tools

RPE06: DATABASES AND RESEARCH METRICS (7Hrs.)

A. Databases (4hrs.)

1. Indexing databases
2. Citation databases: Web of Science, Scopus etc.

B. Research Metrics (3hrs.)

1. Impact Factor of journal as per Journal Citation Report, SNIP, SJR, IPP, Cite Score
2. Metrics: h-index, g-index, i10 index, altmetrics

Suggested Readings

- Bird, A. (2006). *Philosophy of Science*. Routledge.
- MacIntyre, A. (1967) *A Short History of Ethics*. London.
- P. Chaddah, (2018) *Ethics in Competitive Research: Do not get scooped; do not get plagiarized*, ISBN: 978-9387480865
- National Academy of Sciences, National Academy of Engineering and Institute of Medicine. (2009). *On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition*. National Academies Press.
- Rensik, D. B. (2011). What is ethics in research & why is it important. National Institute of Environmental Health Sciences, 1-10. Retrieved from <https://www.niehs.nih.gov/resources/bioethics/whatis/index.cfm>
- Beall, J. (2012). *Predatory publishers are corrupting open*

access. *Nature*, 489(7415), 179-179.
<https://doi.org/10.1038/489179a>

Course Title: Proficiency in Teaching	L	T	P	Credits
Course Code: PPH103	3	0	2	4

Total Hours: 60

Learning Outcomes

On the completion of the course the students will be able to

1. Design and develop learner-centered instructional plans and learning outcomes.
2. Apply innovative teaching strategies and technologies to engage learners.
3. Explore different assessment methods to evaluate student learning.
4. Reflect on teaching experiences and continuously improve teaching practices.
5. Develop effective communication and classroom management skills.

Course Content

UNIT-I 15 Hours

Overview of the course and its objectives - Theories of learning and their implications for teaching - Understanding the role of the teacher and student in the learning process

Writing clear and measurable learning outcomes - Backward design approach and aligning outcomes, assessments, and instructional strategies - Developing a course syllabus and instructional plan

Meaning Nature, definition, scope and importance and teaching. Types of teaching. Society and teaching, Research in teaching, Modern trends in teaching, creativity and teaching,

UNIT-II 15 Hours

Understanding the diverse needs and backgrounds of learners - Creating an inclusive and supportive learning environment - Facilitating active learning and student engagement strategies

Lectures, discussions, and demonstrations - Group work, collaborative learning, and cooperative learning - Problem-based learning, case studies, and simulations

Skills based approach to teaching. Micro-teaching, Macro teaching. methods of teaching, lecture method project method and

discussion method.

UNIT-III 15 Hours

Integrating technology tools into instruction - Online and blended learning approaches - Using educational software and platforms effectively

Formative and summative assessment methods - Designing effective assessments to measure learning outcomes -Providing constructive feedback to students.

UNIT-IV 15 Hours

Verbal and non-verbal communication techniques - Active listening and questioning skills - Developing rapport with students and fostering positive relationships

The importance of reflective practice in teaching - Self-assessment and evaluation of teaching effectiveness - Engaging in ongoing professional development - Teaching in multicultural and international classrooms - Culturally responsive teaching practices

Meaning and concept of Technology, forms of Technology, Integration of technology in teaching and learning. Web based technology; E-learning and virtual learning. Evaluation of Technology-Meaning and purpose, types of technology evaluation; formative, summative, feasibility and maintenance

Transaction mode

Discussions, Case Studies, Microteaching, Classroom Observations, Peer Teaching: Video Analysis, Role-Playing, Teaching Demonstrations, Classroom Simulations, Reflective Journals/Blogs, Teaching Portfolios and Technology Integration

Suggested readings

- *Das, R.C. (1993): Educational Technology – A Basic Text, Sterling Publishers Pvt. Ltd.*
- *Evaut, M. The International Encyclopaedia of Educational Technology.*
- *Haas, K.B. and Packer, H.Q. (1990): Preparation and Use of Audio Visual Aids, 3rd Edition, Prentice Hall, Inc.*

- *HaseenTaj(2006):
modernEducationalTechnology,Agra:H.PBhargava Book
House.*
- *Kumar,K.L.(2008):EducationalTechnology,NewAgeInternationalP
vt.Ltd. Publishers, New Delhi (Second Revised Edition).*
- *Mukhopadhyay,M.(1990):EducationalTechnology–
YearBook1988,All India Association for Educational
Technology, New Delhi.*

Course: Advanced Computer Applications Lab	L	T	P	Credits
CourseCode:PPH104	0	0	4	2

TotalHours30

LearningOutcomes

Onthecompletionofthecoursethestudents willbeableto

1. Thestudentswillbecomefamiliarwiththeusageofsoftwareformanaging the reference.
2. Tomakeliteraturereviewseasily.
3. Tomakereferencemanagementbyusingopensoftware.

CourseContent

Unit-IHours06

Mendeley Software: Mendley software concept, features and Uses-Installation of Mendeley software in your system Creating account. Installing as Plugin inBrowser. Various third party Plugin for Mendeley.

Creating your library: Add PDFS to Mendeley-Import/export EndNote, BibTeX and RIS libraries- Document details lookup (CrossRef, PubMed, and Arxiv) -Google Scholar Search -One-click Web Importer -Watch folders to automatically add PDFs to Mendeley Desktop-Synchronize PDFs with your Mendeley Web account.

Unit-IIHours08

Managing your documents and references: Merge duplicate author names, tags, or publications- Documents can be marked read/unread- Search as you type - Annotate PDFS-Multiple level undo in document details -Tag and edit multiple documents at Once-File Organizer.

Citing references: Word and Open Office plug-in-Cite in Google documents (and other editors) -Cite using BibTeX.

Sharing Documents and References: How to Create a Group Adding members and documents Using Group.

Unit IIIHours 08

Chat GPT: Working of ChatGPT, Role of ChatGPT in research, Advantages of ChatGPT, Query ChatGPT, Paraphrasing, Summarization, Table to Text and Text to Table, Translation to

other language, Programming Code Generation and Explanation,DataObjectConversion(JSONtoXMLtoCSVandVice-versa). Creating Heading and Subheading. Writing and Blogging, Analtzing Data, working with Email (creating, replying and improving).

LinkedIn: Introduction of Linkedin, Creating the Profile, Role of Linkedin in Research, searching for Jobs, Applying for Jobs.

Research Gate: Introduction of Research Gate, Creating the Profile, Role of Researchgate in Research, adding your research Article, Searching and sending request for research.

Unit IVHours 08

Google Classroom: Introduction of Google Education Tools, Features of Google Class room.

Teacher Role: Creating Class or Group, Uploading Lecture/Documents, Creatingand Grading Assignment, Creating and Grading Quizes, Communication with Students and Parents, Creating Survey, Collecting Feedback, Post Announcements, Group Discussion

Supervisor/LeaderRole:CreateandManageClassandGrade,Manage co-teacher and Roaster of Teacher, Group Discussion, Post Announcements.

AdminRole:DataProtection,CreateClassesandRoaster,Addingandr emoving Students.

Scopus:IntroductionofScopus,RoleofScopusinResearch,understan dingdifferent Metrics of Scopus (SJR, Cite Score, H-index, Citation etc.)

SuggestedReadings

- Office2007inSimpleSteps,KogentSolutions,(WileyPublishers)
- MS-Office2007TrainingGuide,S.Jain(BPBPublications).
- ComputerFundamentalsbyP.K.Sinha(BPBPublications).
- <https://www.mendeley.com/reference-management/reference-manager>
- <https://chat.openai.com>
- 1) <https://edu.google.com/workspace-for-education/classroom/>

CourseTitle:Modern concepts of Agronomy, Crop	L	T	P	Credits
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Production and Simulation Modelling, Farming Systems				
CourseCode: PPH110	4	0	0	4

TotalHours60

LearningOutcomes

Onthecompletionofthecoursethestudents willbeableto

1. Acquire knowledge about systems approach and to simulate yields and growth of crops under varied soil and weather conditions with different management practices, and their optimization
2. Appraised about cropping and farming systems, types of integrated farming systems under different agro-ecosystems
3. Understand about farming systems research and optimization methodologies
4. To get knowledge about crop residue management- recycling and precision agriculture.

Course Content

UNIT I 15Hours

Environmental concerns related to intensive use of agricultural inputs. Sustainable agriculture - need, scope, practices and economic evaluation, holistic approach of farming systems. Agro- physiological basis of variation in yield, role of agro-biodiversity in sustainable food production, GM crops, crop diversification for improved food and nutritional security. Systems classification; flow charts, modelling techniques and methods of integration - state, rates and driving variables, feedbacks and relational diagrams.

UNIT II 15Hours

Conservation agriculture, modern approaches for improving resource-use efficiency, crop residue management in multiple cropping systems. Principles and practices of conservation tillage and watershed management, carbon sequestration. Elementary models for crop growth based on basic methods of classical growth analysis. Crop modelling methods for crop-weather interaction, climate change and variability components.

UNIT III 15Hours

Precision farming - current status and opportunities for adoption in India. GIS, GPS and remote sensing for crop management, global warming. Contract farming - concept, scope, partnerships, types, characteristics, management and administration, problems and advantages for farmers/ sponsors, WTO issues in agriculture. DSSAT, APSIM, INFOCROP and

UNIT IV

15Hours

Crop modelling, systems classification; flow charts, modelling techniques and methods of integration - state, rates and driving variables, feedbacks and relational diagrams information technology, elementary models for crop growth based on basic methods of classical growth analysis. Potential production: leaf and canopy CO₂ assimilation, respiration, dry matter accumulation, crop phenology and dry matter distribution and development in different crops. Estimation of generic coefficients.

Suggested Readings:

- Nagamani, C., Reddy, S. R. 2018. *Principles of Crop Production*. India: Kalyani Publishers. pp. 852.
- Lichtfouse, E. 2020. *Sustainable Agriculture Reviews* 40. Germany: Springer International Publishing. pp. 241.
- Reddy, S. R. 2007. *Principles of Agronomy*. India: Kalyani Publishers. pp 611
- Mathews, R.B., Kropff, M.J., Bachelet, D. and VaanLaar, H.H. (Eds.). 2001. *Modelling the Impact of Climate Change on Rice Production in Asia*. CABI. pp 289.
- Vries, F. W. T. P. d. (2000). *Simulation of Ecophysiological Processes of Growth in Several Annual Crops*. Netherlands: Pudoc. pp. 271.
- Hoogenboom, G., Thornton, P. (2000). *Understanding Options for Agricultural Production*. Netherlands: Springer Netherlands. pp. 400.