

SYLLABUS

Based on

**CHOICE BASED CREDIT SYSTEM (CBCS) under
LEARNING OUTCOMES BASED CURRICULUM
FRAMEWORK (LOCF)**

Ph. D. (Rural Technology)

2021-2022



**DEPARTMENT OF RURAL TECHNOLOGY AND SOCIAL
DEVELOPMENT**

GURU GHASIDAS VISHWAVIDYALAYA
(A Central University)
Koni- Bilaspur 495009 Chhattisgarh

Program Outcomes (Pos) of Ph D. Programs

PO1. Knowledge and Awareness: Adequate information on basics and advance fields of the core and applied subjects will be provided to enhance knowledge and awareness so that a professionalism may be developed in students.

PO2. Problem solving and Critical Thinking: To enable the students to take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO3. Effective Communication and Social Interactions: Speak, read, write and listen clearly individually and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology. Realize and respect of views of others, mediate disagreements and cooperate to reach conclusions in group settings.

PO4. Effective Citizenship and Ethics: To groom the students in such a way that they perform empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering. Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

PO5. Environmental awareness and Sustainability, Self-directed and Life-long Learning:: Understand the issues of environmental contexts and sustainable development. Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological, socio-economic and socio-cultural improvements.

PO6. Skill Development and Employability: To generate special skill through vocational training, workshops, field visits, entrepreneurial and career development courses so that students may generate employability for themselves and others.

Program Specific Outcomes

PSOs of Ph.D. Rural Technology Program

PSO1. Understand meaning of research, research objectives, types of research, formulating research problem, methods of data collection, statistical analysis, research and publication ethics, academic writing, basics of communication skill.

PSO2. Understand various aspects of rural technology, medicinal plant, mushroom and lac production, concept of rural energy systems, remote sensing and GIS.

PSO3. Understand non timber forest products, Scope of apiculture, sericulture, methods of extraction and distillation principles of various natural products.

Pre- Ph.D. Rural Technology Syllabus

Course Code: RT-2001

Marks: 100

Course Title: Research Methodology and Ethics

Course outcomes

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

1. Understand concepts of research, its types, objectives, experimental design etc.
2. Understand statistics and its applications in various fields of research.
3. Understand various methods of data collection, research and publication ethics.

Meaning of research, Motivation in research, Statement of research objectives, Types of research, Defining and formulating research problem, Hypothesis for research, Research process, Criteria of good research, Problems encountered by researchers. Research designs- Exploratory, Descriptive and Experimental research designs.

Types of data, Various methods of data collection- Observation, Schedule and Questionnaires, Survey, Case study, Data sources. Literature survey. Measurement and scaling techniques.

Statistical quality control- Causes of variations in quality characteristic, Quality control chart, purpose and logic, Computing control limits. Process under control and out of control. Statistical tools and analysis, measures of dispersion.

Research Ethics: definition, moral philosophy, Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: Falsification, Fabrication, and Plagiarism, 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 behaviour and vice versa, types, Violation of publication ethics, authorship and contributorship. Scientific communication- Basics of communication skills, Writing- research reports, research papers, research proposals and

review articles. Importance of research proposal and research papers. Methods of research presentations. Communication with editors. Handling referee's comments, galley proof, indexing services, common measurements of quality scientific work.

Course Outcomes and their mapping with Programme Outcomes:

CO	PO						PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	2	3	2	1
CO2	3	3	1	-	1	2	3	1	1
CO3	3	2	1	1	1	2	2	1	1

Weightage: 1- Slightly; 2- Moderately; 3- Strongly

Pre- Ph.D. Rural Technology Syllabus

Course Code: RT-2002

Marks: 100

Course Title: Rural Technology-I

Course outcomes

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

1. Understand concept of rural technology
2. Understand medicinal plants and their uses for health, mushroom and lac production techniques.
3. Concept of rural energy system and concept and applications of remote sensing and GIS

Rural technology: Definition and concept rural technology, Appropriate Technology, characteristics of technology, characteristics of innovation, concept and factor related to the technology transfer.

Medicinal plant: Useful part of medicinal plant, factors influencing variability of drugs, indigenous drug, Medicinal Systems-Traditional and Modern.

Mushroom: Innovation technique in spawn production, mushroom production and their management.

Lac insects: Life cycle, Innovation in cultivation technology and processing technique of lac. Properties and uses of lac.

Concept of Rural Energy Systems. Energy need of rural and urban area. Role of energy in Human development and need for native energy systems. Future energy challenges Bio energy resources. Rural needs of solar energy. Development of Rural bio energy systems.

Remote Sensing and its application in natural resource management, GPS and its applications,

Geospatial technology and its application in environment and natural disaster management.

Course Outcomes and their mapping with Programme Outcomes:

CO	PO						PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	2	1	3	1
CO2	3	3	1	-	1	2	1	3	1
CO3	3	2	1	1	1	2	1	3	1

Weightage: 1- Slightly; 2- Moderately; 3- Strongly

Pre- Ph.D. Rural Technology Syllabus

Course Code: RT-2003

Marks: 100

Course Title: Rural Technology-II

Course outcomes

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

1. Understand non timber forest products, Scope of apiculture, sericulture.
2. Understand methods of extraction and distillation principles of various natural products.
3. Understand concept of GIS and its applications.

Non timber forest products, Classification and its utilization, Essential oils- grass, wood, leaf, root and flower oils. Methods of extraction of essential oils, distillation principles and method of extraction, Dyes- wood, bark, flower and fruit, root dyes. Wild edible roots, spices. Natural poisons and insecticides.

Scope of apiculture, Innovation in artificial bee keeping (Apiary), Collection technique of honey at natural sites, Economic importance of honey bee wax.

Innovation in propagation or cultivation techniques of different host plants for sericulture. Innovation in silk production techniques from rearing to weaving industries.

Methods of extraction and distillation principles of various natural products, Resins & resin combinations. Tannins & tanning containing drugs, terpenoid drugs, alkaloids.

G.I.S. concepts, components of G.I.S. data base management system, Application of GIS in natural resource management, Water conservation practices and related government policies.

Course Outcomes and their mapping with Programme Outcomes:

CO	PO						PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	2	1	3	1
CO2	3	3	1	-	1	2	1	3	1
CO3	3	2	1	1	1	2	1	3	1

Weightage: 1- Slightly; 2- Moderately; 3- Strongly

Pre- Ph.D. Rural Technology Syllabus

Course Code: RT-2004

Marks: 100

Course Title: Seminar

In addition to above mentioned three theory papers, one seminar with power point presentation will be delivered by the scholar on any theme of his area of research interest which will include all sequences of research, development of communication skill and presentation analysis.

Course outcomes

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

1. Understand meaning of research, research objectives, types of research, formulating research problem, methods of data collection, statistical analysis, research and publication ethics, academic writing, basics of communication skill.
2. Understand various aspects of rural technology, medicinal plant, mushroom and lac production, concept of rural energy systems, remote sensing and GIS.
3. Understand non timber forest products, Scope of apiculture, sericulture, methods of extraction and distillation principles of various natural products.

Course Outcomes and their mapping with Program Outcomes:

COs	POs						PSOs				
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	-	2	3	-	-	3	3	3
CO2	3	3	1	-	2	3	-	-	3	3	3
CO3	3	3	1	-	2	3	-	-	3	3	3

Weightage: 1-Slightly; 2-Moderately; 3-Strongly