# Guru Ghasidas Vishwavidyalaya (A Central University) Bilaspur - 495009 (C.G.)

#### **DEPARTMENT OF BOTANY**

# **POs Under-Graduate Programme**

### **Programme Outcomes (POS)**

PO1	Knowledege: To meet the professional requirements Knowledege will be
	provided on basics and advance fields of the core and applied fields
<u>PO2</u>	<u>Critical Thinking:</u> Special skill for critical thinking on contextual knowledge
	of living beings/ organisms, non-living components and environmental
	basis of life, enabling the students for critical analysis of day-to-day
	problems.
<u>PO3</u>	<b>Skill &amp; Application Development</b> : Understanding of application of
	biological materials in food, health, medicine & Environment for
	sustainable development of the society, development of skill-based
	knowledge on theory and methodology for use in descriptive and
	inferential statistical tools and techniques.
<u>PO4</u>	Ethics: Internalisation of and sensitiveness to sound professional ethics for
	use to solve societal problems.
<u>PO5</u>	Inter-disciplinary & Multi-disciplinary Approach: Understanding of the
	vital connections within and among the flora, fauna and the physical
	environment so is to enable to integrate and synthesized
<u>PO6</u>	Problem Solving & Employability: Special skill through vocational trainings,
	field visits, entrepreneurial and career development approach in research
	and development issues in the society.

# **B.Sc. Botany Hon's** What is **√**?

Sem	Course	Code	<u>PO1</u>	<u>PO2</u>	<u>PO3</u>	<u>PO4</u>	PO5	<u>PO6</u>
		<b>Core Courses</b>						
1	Phycology and Microbiology	BOUATT1	✓	✓	<b>√</b>	<b>√</b>	<b>√</b>	<
1	Biomolecules and Cell Biology	BOUATT2	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	
II	Mycology and Phytopathology	BOUBTT3	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	✓
II	Archegoniate: Bryophytes,	BOUBTT4	<b>√</b>					
	Pteridophytes, Gymnosperms							
III	Anatomy od Angiosperms	BOUCTT5	✓	✓	<b>√</b>			<
<u>III</u>	<b>Economic Botany and Plant</b>	BOUCTT6	✓	<b>√</b>	<b>√</b>	<b>√</b>		<b>✓</b>
	Resource Utilization							
Ш	Genetics and Cytogenetics	BOUCTT7	✓	✓	✓		✓	<b>✓</b>
<u>IV</u>	Molecular Biology	BOUDTT8	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	✓

Phytogeography   Iv   Plant Systematics   BOUDTT10   V   V   V   V   V   V   V   V   V	IV	Plant Ecology and	BOUDTT9	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	
Y         Plant Physiology         BOUETT11         √         √         √           Y         Plant Metabolism         BOUETT12         √<	_			•						
Y         Plant Metabolism         BOUETT12         √         √         √         √         √         √         √         ✓ <td>IV</td> <td>Plant Systematics</td> <td>BOUDTT10</td> <td><b>√</b></td> <td><b>√</b></td> <td><b>√</b></td> <td><b>√</b></td> <td><b>√</b></td> <td><b>√</b></td>	IV	Plant Systematics	BOUDTT10	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	
Biodiversity and Conservation   BOUFTT13	<u>v</u>	Plant Physiology	BOUETT11	<b>√</b>	<b>√</b>	<b>√</b>				
Microbiology   BOUATD   Microbiology	<u>v</u>	Plant Metabolism	BOUETT12	<b>√</b>	<b>√</b>	<b>√</b>				
Plant Biotechnology and Genetic Engineering   BOUATD1   V   V   V   V   V   V   V   V   V	VI	<b>Biodiversity and Conservation</b>	BOUFTT13	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	
Plant Biotechnology and Genetic Engineering Plant Biotechnology and Genetic Engineering Plant Biochemistry BOUATD2	VI	Reproductive Biology of	BOUFTT14	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>		
Plant Biotechnology and Genetic Engineering Plant Biochemistry  Plant Biochemistry  Research Methodology  BOUATD2  V V V V V Sibiostatistics  BOUATD4 V V V V V V V V V V V V V V V V V V V										
Genetic Engineering   Plant Biochemistry   BOUATD2		T			irses				1	
Plant Biochemistry Research Methodology BOUATD3 V V V V V V Silostatistics BOUATD4 V V V V V V V V V V V V V V V V V V V			BOUATD1	✓	✓	✓	✓	✓	✓	
Research Methodology Biostatistics Biostatistics BOUATD4 V V V V V V V V V V V V V V V V V V V					<u> </u>					
Biostatistics BOUATD4  Natural Resource Management  Industrial and Environmental Microbiology Aquatic Botany Bioinformatics BOUATD5  Aquatic Botany BOUATD7  Bioinformatics BOUATD8  BOUATD8  Bio-Analytical Techniques BOUATD9  Bou-Analytical Techniques BOUATD10  Generic Elective Courses  Food Science BOUCTG1  Community Forestry BOUCTG2  Community Forestry BOUCTG3  Industrial Microbiology BOUCTG4  Plant Microbes Interaction BOUCTG5  Plant Diversity and Human Welfare  Environmental Protection BOUCTG8  Environmental Toxicity BOUCTG9  Algal Biotechnology BOUCTG1  Algal Biotechnology BOUCTG1  Algal Biotechnology BOUCTG3  Algal Biotechnology BOUCTG5  Algal Biotechnology BOUCTG7  Ability Enhancement Courses  Mushroom Culture Technology BOUATA2  Plants in Traditional Systems of Medicine Good Laboratory Practices BOUATA3  A J J J J J J J J J J J J J J J J J J		<u>'</u>		1		1				
Natural Resource Management  Industrial and Environmental Microbiology Aquatic Botany Bioinformatics BOUATD7 Bioinformatics BOUATD8 BOUATD7 Bioinformatics BOUATD8 BOUATD9 Bio-Analytical Techniques BOUATD10 Bio-Analytical Techniques BOUATD10 BOUCTG1 Community Forestry BOUCTG2 BOUCTG3 BOUCTG3 BOUCTG3 BOUCTG3 BOUCTG3 BOUCTG4 BOUCTG5 BOUCTG5 BOUCTG5 BOUCTG5 BOUCTG5 BOUCTG6 BOUCTG6 BOUCTG7 BO								+		
Management   Industrial and Environmental   BOUATD6				+		1		_	<b>√</b>	
Industrial and Environmental Microbiology			BOUATD5	✓	✓	<b>√</b>	<b>√</b>	✓	✓	
Microbiology Aquatic Botany BOUATD7 Aquatic Botany Bioinformatics BOUATD8 Algorithm Streeding BOUATD9 Bio-Analytical Techniques BOUATD10 Agnorated Science BOUCTG1 Community Forestry BOUCTG2 BOUCTG3 Algorithm Streeding BOUCTG4 Algorithm Streeding BOUCTG5 Algorithm Streeding BOUCTG6 BOUCTG6 Algorithm Streeding BOUCTG7 Algorithm Streeding BOUCTG8 Algorithm Streeding BOUCTG9 BOUCTG9 Algorithm Streeding BOUCTG1 Algorithm Streeding BOUCTG9 Algorithm Streeding BOUCTG9 Algorithm Streeding BOUCTG1 Algorithm Streeding BOUCTG1 Algorithm Streeding BOUCTG3 Algorithm Streeding BOUCTG3 Algorithm Streeding BOUCTG4 Algorithm Streeding BOUCTG5 Algorithm Streeding BOUCTG7 Algorithm Streeding BOUCTG9 Algorithm Streeding BOUCTG10 Algorithm Streeding BOUCTG11 Algorithm Streeding BOUCTG10 Algorithm Streeding BO			20114726							
Aquatic Botany BOUATD7			BOUATD6	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>V</b>	
Bioinformatics BOUATDB Flements of Plant Breeding BOUATD9 Flements of Plant Breeding BOUATD9 Flements of Plant Breeding BOUATD10 Flements of Plant Breeding Flements of Plant Breeding BOUATD10 Flements of Plant Breeding BOUATD10 Flements of Plant Breeding Flements		1	POLIATO7	,		,	,	,		
Elements of Plant Breeding BOUATD9		' '		1	,		<b>V</b>			
Bio-Analytical Techniques  Generic Elective Courses  Food Science  BOUCTG1				1				_		
Food Science  BOUCTG1				-		-				
Food Science  BOUCTG1  Community Forestry  BOUCTG2  Seed Technology  BOUCTG3  Industrial Microbiology  BOUCTG4  Plant Microbes Interaction  BOUCTG5  Global Climate Change  BOUCTG6  Plant Diversity and Human  Welfare  Environmental Protection  BOUCTG8  Environmental Toxicity  BOUCTG9  Algal Biotechnology  BOUCTG9  BOUCTG9  Ability Enhancement Courses  Mushroom Culture  Technology  Medicinal Botany  BOUATA1  Plants in Traditional Systems  of Medicine  Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  V  V  V  V  V  V  V  V  V  V  V  V  V		· · · · · · · · · · · · · · · · · · ·			<b>√</b>	<b>✓</b>	<b>V</b>	<b>√</b>	<b>V</b>	
Community Forestry  Seed Technology  BOUCTG2  J J J J J J J J Seed Technology  BOUCTG3  J Industrial Microbiology  BOUCTG4  Plant Microbes Interaction  BOUCTG5  Global Climate Change  BOUCTG6  Plant Diversity and Human  Welfare  Environmental Protection  BOUCTG7  Environmental Toxicity  BOUCTG8  BOUCTG9  Finitronmental Microbiology  BOUCTG10  Algal Biotechnology  BOUCTG11  Ability Enhancement Courses  Mushroom Culture  Technology  Medicinal Botany  Plants in Traditional Systems  of Medicine  Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  J J J J J J J J J J J J J J J J J J					/		1		1	
Seed Technology   BOUCTG3				1						
Industrial Microbiology  Plant Microbes Interaction  BOUCTG5  Global Climate Change  BOUCTG6  Plant Diversity and Human  Welfare  Environmental Protection  BOUCTG8  Environmental Toxicity  BOUCTG9  Finvironmental Microbiology  BOUCTG10  Algal Biotechnology  BOUCTG11  Ability Enhancement Courses  Mushroom Culture  Technology  Medicinal Botany  BOUATA1  Plants in Traditional Systems  of Medicine  Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  J  J  J  J  J  J  J  J  J  J  J  J  J					<b>V</b>					
Plant Microbes Interaction BOUCTG5				1	,		_	_		
Global Climate Change  Plant Diversity and Human  Welfare  Environmental Protection  Environmental Toxicity  Environmental Microbiology  Algal Biotechnology  BOUCTG10  Ability Enhancement Courses  Mushroom Culture Technology  Medicinal Botany  Plants in Traditional Systems of Medicine  Good Laboratory Practices  BOUCTG6  J J J J J J J J J J J J J J J J J J J				<del> </del>		+	_	_		
Plant Diversity and Human Welfare  Environmental Protection BOUCTG8 Finitronmental Toxicity BOUCTG9 Finitronmental Microbiology BOUCTG10 Finitronmental Microbiology BOUCTG11 Finitronmental Microbiology Finitronmental Microbiology BOUCTG10 Finitronmental Microbiology										
Welfare Environmental Protection BOUCTG8  Finite Bouctg9  Environmental Toxicity BOUCTG9  Environmental Microbiology BOUCTG10  Algal Biotechnology BOUCTG11  Ability Enhancement Courses  Mushroom Culture Technology  Medicinal Botany BOUATA1  Plants in Traditional Systems of Medicine  Good Laboratory Practices BOUATA5  J  J  J  J  J  J  J  J  J  J  J  J  J		-								
Environmental Protection  Environmental Toxicity  Environmental Microbiology  Environmental Microbiology  BOUCTG10  Algal Biotechnology  BOUCTG11  Ability Enhancement Courses  Mushroom Culture Technology  Medicinal Botany  BOUATA1  Plants in Traditional Systems of Medicine  Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  J  J  J  J  J  J  J  J  J  J  J  J  J		-	воостал	<b>V</b>	<b>V</b>	<b>V</b>	<b>V</b>	<b>'</b>	<b>V</b>	
Environmental Toxicity  Environmental Microbiology  BOUCTG10  Algal Biotechnology  BOUCTG11  Ability Enhancement Courses  Mushroom Culture Technology  Medicinal Botany  Plants in Traditional Systems of Medicine  Good Laboratory Practices  BOUATA1  BOUATA2  Final Bouatas  BOUATA3  Final Bouatas  BOUATA3  Final Bouatas  F			BOUCTG8	./	./	./	1	_/	/	
Environmental Microbiology BOUCTG10							_			
Algal Biotechnology  Ability Enhancement Courses  Mushroom Culture Technology  Medicinal Botany  BOUATA1  BOUATA2  Plants in Traditional Systems of Medicine  Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  J  J  J  J  J  J  J  J  J  J  J  J  J		-		1			_			
Ability Enhancement Courses    Mushroom Culture					+			+		
Mushroom Culture       BOUATA1       ✓ <td></td> <td colspan="9">9.</td>		9.								
Technology  Medicinal Botany  BOUATA2  V  V  V  V  V  V  V  Intellectual Property Rights  Medicine  BOUATA3  V  V  V  V  V  V  V  V  V  V  V  V  V						<b>√</b>	<b>J</b>	<b>J</b>	1	
Medicinal Botany       BOUATA2       ✓ <td></td> <td></td> <td></td> <td>  •</td> <td></td> <td></td> <td></td> <td></td> <td></td>				•						
of Medicine Good Laboratory Practices BOUATA4 ✓ ✓ ✓ Intellectual Property Rights BOUATA5 ✓ ✓ ✓ ✓ ✓		1	BOUATA2	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	
Good Laboratory Practices  BOUATA4  Intellectual Property Rights  BOUATA5  J  J  J		Plants in Traditional Systems	BOUATA3	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	
Intellectual Property Rights BOUATA5 🗸 🏑 🏑 🏑		_								
		Good Laboratory Practices	BOUATA4	<b>√</b>		<b>√</b>		<b>√</b>		
History of Indian Science BOUATA6 🗸		Intellectual Property Rights	BOUATA5	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	
		History of Indian Science	BOUATA6	<b>√</b>				✓		

	Sk	ill Enhancement (	Course	S				
Botanical G Landscaping		BOUATL1	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	✓
Agriculture Microbiolog		BOUATL2	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	✓
Biofertilizer	's	BOUATL3	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
Herbal Tech	nology	BOUATL4	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
Environmer Analysis	ntal Impact	BOUATL5	<b>√</b>	<b>√</b>	<b>√</b>	✓	<b>√</b>	✓
Floriculture		BOUATL6	<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
Forensic Bo	tany	BOUATL7	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>

# **POs Post-Graduate Programme**

### **Programme Outcomes (POS)**

PO1	Knowledge: Knowledge will be provided on basics and advance fields of the
	core and applied disciplines to fulfil the professional requirements
PO2	Critical Thinking: Develop critical thinking on appropriate knowledge of
	living beings/ organisms, non-living components and environmental basis of
	life, which will enable students for critical analysis of day-to-day problems.
<u>PO3</u>	Skill & Application Development: Skill based knowledge on theoretical and
	methodological understandings of use of different descriptive and
	inferential statistical tools and techniques for application of biological
	materials in food, health, medicine & Environment for sustainable
	development of the society.
<u>PO4</u>	Inter-disciplinary & Multi-disciplinary Approach: Understanding of the vital
	connections of flora, fauna and the physical environment so is to enable to
	integrate and synthesized
<u>PO5</u>	Ethics: Internalisation of and sensitiveness to sound professional ethics for
	use in day-to-day life in the society.
PO6	Problem Solving & Employability: Special skill through vocational trainings,
	field visits, entrepreneurial and career development approach to develop
	capability to handle various problems and development of scientific
	temperament in research and development issues in the society.

### M.Sc Botany:

Sem	Course	Code	<u>PO1</u>	<u>PO2</u>	<u>PO3</u>	<u>PO4</u>	<u>PO5</u>	<u>PO6</u>
		<b>Core Courses</b>						
1	Advances in Virus, Bacteria and Algae	BOPATT1	<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	
I	Applied Mycology and Advance Phytopathology	BOPATT2	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>

				_				
I	Advances in Bryophytes,	BOPATT3	✓		✓		<b>√</b>	
	Pteridophytes and							
	Gymnosperms							-
I	Ecosystem Services and	OPNBO01	<b>√</b>	✓	<b>√</b>	✓	✓	<b>√</b>
	Biodiversity  Call Biology and Malagylan	DODDTT4	,			,		
II	Cell Biology and Molecular	BOPBTT4	✓	✓	<b>√</b>	✓	✓	<b>√</b>
	Biology	BOPBTT5	,	,				
<u>II</u>	Taxonomy of Angiosperm		<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	
<u>II</u>	Plant Biochemistry	BOPBTT6	<b>√</b>	<b>√</b>	<b>√</b>		<b>√</b>	<b>√</b>
<u>II</u>	Ecology and Environment	BOPBTT7	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>II</u>	Research Methodology	BOPBTT11	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>III</u>	Plant Anatomy and	BOPCTT8	✓	✓	✓		✓	
	Reproductive Biology							
<u>III</u>	Genetics and Cytogenetics	ворстт9	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>III</u>	Plant Physiology	BOPCTT10	✓	✓	✓		✓	
	Discipline Speci	fic Elective Co	urses	- BASK	ET 1			
<u>III</u>	Algae, Environment and		✓	✓	✓	✓	✓	✓
	human Welfare							
<u>III</u>	Biofertilizer and Biopesticides		✓	✓	✓	✓	<b>√</b>	✓
	Technology							
<u> III</u>	Bioinformatics and		<b>√</b>	✓	<b>√</b>	✓	✓	<b>√</b>
	Evolutionary Biology							
<u>III</u>	Environmental Microbiology		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u> III</u>	Herbal Product Development		✓	✓	<b>√</b>	✓	✓	<b>√</b>
III	and Formulation		,		,	1	,	,
	Microbial Physiology		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>III</u>	Plant Stress Biology		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>III</u>	Environmental biology		<b>√</b>	✓	<b>√</b>	✓	✓	✓
	1	DSE - BASKET	1 -	T .				T .
<u>IV</u>	Agricultural Microbiology		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>IV</u>	Biodiversity and		✓	✓	<b>√</b>	✓	✓	✓
13.7	Conservation  Ethnology and Traditional		,			,		,
<u>IV</u>	Ethnobotany and Traditional knowledge		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
IV	Herbal Cosmetics		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
$\vdash$	Microbial Technology			_			_	
<u>IV</u>			<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
<u>IV</u>	Plant Propagation and Nursery Development		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
IV	Plant Tissue Culture and		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>1</b>	<b>/</b>
••	Application		•	<b>V</b>	•	•	•	•
	1 4 4	DSE - BASKET	3	1	-	1	1	
<u>IV</u>	Environmental Pollution		<b>V</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
IV	Ethno-Pharmacognosy and		<b>V</b>	<b>√</b>	1	<b>√</b>	<b>1</b>	<b>√</b>
	Nutraceuticals						•	
IV	Food Microbiology		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
		1	1 -					

<u>IV</u>	Global Change Biology	<b>&gt;</b>	✓	✓	<b>√</b>	✓	✓
<u>IV</u>	Microbial Genetics	<b>✓</b>	✓	✓	<b>√</b>	<b>√</b>	<
<u>IV</u>	Plant Functional Genomics	<b>\</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<
<u>IV</u>	Plant Systematics	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	✓
<u>IV</u>	Plant Diversity, Uses and	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>
	Conservation						

Head

**Department of Botany**