

Course Outcomes – Program Outcomes (COPO) Mapping and Attainment

Program Outcomes (PO): B.Sc. (H) Botany

PO1: Understanding of plant classification systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics and molecular biology of various life-forms.

PO2: Understanding of various analytical techniques of plant sciences, use of plants as industrial resources or as human livelihood support systems and is well versed with the use of transgenic technologies for basic and applied research in plants.

PO3: Understanding of various life forms of plants, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, transgenic technology and use of bioinformatics tools and databases and the application of statistics to biological data.

PO4: Understanding of biotechnological processes such as recombinant DNA technology and its applicative value in pharmaceuticals (vaccines, antibodies, antibiotics etc.), food industry (transgenic crops with improved qualities (nutraceuticals, industrial enzymes etc.), agriculture (biotic and abiotic stress tolerant plants, disease and pest resistant plants, improved horticultural varieties etc.), ecology (plants role in bioremediation).

Sem	Code	Course	CO	Statement		
Ι	32161101	Microbiology And	CO1	Students would have understanding of the		
		Phycology		classification, characteristic features, cell structure.		
			CO2	Growth and reproduction in viruses, bacteria, and		
				various groups of marine and fresh water algae.		
			CO3	Ecological and economic importance.		
II	32161201	Mycology And	CO1	Understand the world of fungi, lichens and		
		Phytopathology		pathogens of plants.		
			CO2	Understand characteristics the ecological and		
				economic significance of the fungi and lichens.		

Course Outcomes (CO): B.Sc. (H) Botany

			CO3	Understand the application of mycology in various		
				fields of economic and ecological.		
			CO4	Significance		
			CO5	Understand the economic and pathological importance of fungi bacteria and viruses		
				importance of fungi, bacteria and viruses		
			CO6	Identify common plant diseases and their contro measures.		
III	32161301	Anatomy Of Angiosperms	CO1	Knowledge of various cells and tissues, meristem, epidermal and vascular tissue system in plants.		
			CO2	Various aspects of growth, development of the tissues and differentiation of various plant organs. Knowledge of basic structure and organization of plant parts in angiosperms.		
			CO3	Correlation of structure with morphology and functions.		
IV	32161401	Molecular Biology	CO1	Understanding of nucleic acid, organization DNA in prokaryotes and Eukaryotes, DNA replication mechanism, genetic code and transcription process.		
			CO2	Processing and modification of RNA and translation process, function and regulation of expression.		
			CO3	Application in biotechnology.		
V	32161501	Reproductive Biology Of	CO1	Induction of flowering, molecular and genetic aspects of flower development.		
		Angiosperms	CO2	Anther structure, pollen development, dispersal and pollination.		
			CO3	Ovule, embryo sac development and fertilization.		
			CO4	Endosperm development and its importance.		
			CO5	Alternative pathways of reproduction and their importance.		
			CO6	Student would be able to apply this knowledge for conservation of plants, pollinators and fruit development.		

VI	32161601	Plant Metabolism	CO1	Concept and significance of metabolic redundancy in plants.
			CO2	Students will also be able to learn the similarity and differences in metabolic pathways in animals and plants.
			CO3	To have understanding of water and nutrient uptake and movement in plants, role of mineral elements, translocation of sugars, Role of various plant growth regulators, phytochrome cytochromes and phototropins, and flowering stimulus.

COPO Mapping: B.Sc. (H) Botany

Sem	PO	PO1	PO2	PO3	PO4
	CO				
Ι	CO1	Х			
	CO2		Х		
	CO3			Х	
II	CO1	Х			
	CO2		Х		
	CO3				Х
	CO4		Х		
	CO5			Х	
	CO6	Х			Х
III	CO1	Х			
	CO2		Х		
	CO3			Х	
IV	CO1	Х	Х		
	CO2	Х		Х	
	CO3		Х		Х
V	CO1			Х	
	CO2	Х			
	CO3		Х		
	CO4			Х	
	CO5		Х		
	CO6		Х		
VI	CO1			Х	
	CO2	Х			Х
	CO3			Х	

Attainment of COs and POs in B.Sc. (H) Botany

ASSESSMENT TOOLS:



CO Attainment Tools:



Internal Assessment Score:

> The internal assessment score is determined as per the following rubrics:

% of attempts >= 60%	Level of Attainment	
>=80 %	3	High
>70 to <80 %	2	Medium
60-70 %	1	Low

University Examination Score:

The University examination score is determined as per the following rubrics:

% of attempts >= 60%	Level of Attainment		
>=80 %	3	High	
>70 to <80 %	2	Medium	
60-70 %	1	Low	

Overall CO Attainment

➤ The overall CO attainment is calculated on a scale of 3 by considering 80 % of the level of attainment from University examination and 20% of the level of attainment from Internal assessment.

Program: B.Sc. (H) Botany Course Name: MICROBIOLOGY AND PHYCOLOGY Course Code: 32161101 Semester I

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
19026556001	KAPIL GARG	23	8	76
19026556002	SOUMYA SINGH	17	8	76
19026556003	SANDRA S. P.	19	7	66.5
19026556004	BANITA GAWARIA	24	9	85.5
19026556005	DIYA SHARMA	23	10	95
19026556006	ARADHYA PANWAR	22	9	85.5
19026556007	B. GOPAL	21	9	85.5
19026556008	KABALAPALLY JAGAN	18	7	66.5
19026556009	KHATRAVATH AJAY	20	8	76
19026556010	SIMRAN CHAUHAN	21	9	85.5
19026556012	BOKKA PRAVARDHAN	19	7	66.5
19026556013	NAVEEN	24	9	85.5
19026556014	DIVITA	23	9	85.5

19026556015	SIMRAN MORAL	16	8	76
19026556016	DEVIKA K. V.	20	9	85.5
19026556017	PRAGYA	22	9	85.5
19026556018	ARVIND KUMAR VAISHNAV	22	9	85.5
19026556019	NITIKA	22	9	85.5
19026556021	PERRY WINKLE	19	9	85.5
19026556022	NIKHILA KUNNUTHOTTIYIL	23	9	85.5
19026556023	ABHAY BANYAL	23	10	95
19026556024	MANASVI CHATURVEDI	24	10	95
19026556025	AKANKSHA KUSHWAHA	25	10	95
19026556026	RANIA RAZAK KUNHIPARAMBATH	19	8	76
19026556027	SIYA DEONIAN	23	10	95
19026556028	KASHISH GANGASH	21	9	85.5
19026556029	PRACHI SHARMA	21	9	85.5
19026556030	NIHARIKA SINGH	8	5	47.5
19026556031	ROHAN YADAV	22	9	85.5
19026556032	VASUPRIYA	21	9	85.5
19026556033	MOHAMMED SANEEN P	20	8	76

S	Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
		-		Attainment		Attainment	CO Attainment
		No: of attempts $\geq 60\%$	30		30		
	Ι	Total Attempts	31	3	31	3	3
		% of attempts >= 60%	96.77		96.77		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

Sem I	PO1	PO2	PO3	PO4
CO1	3			
CO2		3		
CO3			3	

% of attempts >= 60%	Level of Attainment	
>=80 %	3	High
>70 to <80 %	2	Medium
60-70 %	1	Low

Program: B.Sc. (H) Botany Course Name: MYCOLOGY AND PHYTOPATHOLOGY Course Code: 32161201 Semester II Attainment (Direct Assessment)

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
		25	10	95
19026556001	KAPIL GARG			
19026556002	SOUMYA SINGH	21	9	85.5
19026556003	SANDRA S. P.	24	9	85.5
19026556004	BANITA GAWARIA	25	10	95
19026556005	DIYA SHARMA	25	10	95
19026556006	ARADHYA PANWAR	25	10	95
19026556007	B. GOPAL	23	9	85.5
19026556008	KABALAPALLY JAGAN	23	9	85.5
19026556009	KHATRAVATH AJAY	23	9	85.5
19026556010	SIMRAN CHAUHAN	23	9	85.5
19026556012	BOKKA PRAVARDHAN	22	9	85.5
19026556013	NAVEEN	23	10	95

19026556014	DIVITA	25	10	95
19026556015	SIMRAN MORAL	23	9	85.5
19026556016	DEVIKA K. V.	25	10	95
19026556017	PRAGYA	25	10	95
19026556018	ARVIND KUMAR VAISHNAV	25	10	95
19026556019	NITIKA	24	10	95
19026556021	PERRY WINKLE	24	9	85.5
19026556022	NIKHILA KUNNUTHOTTIYIL	24	10	95
19026556023	ABHAY BANYAL	25	10	95
19026556024	MANASVI CHATURVEDI	24	10	95
19026556025	AKANKSHA KUSHWAHA	25	10	95
19026556026	RANIA RAZAK KUNHIPARAMBATH	22	9	85.5
19026556027	SIYA DEONIAN	25	10	95
19026556028	KASHISH GANGASH	23	9	85.5
19026556029	PRACHI SHARMA	23	10	95
19026556030	NIHARIKA SINGH	23	9	85.5
19026556031	ROHAN YADAV	24	9	85.5
19026556032	VASUPRIYA	24	10	95
19026556033	MOHAMMED SANEEN P	23	9	85.5

Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
	_		Attainment		Attainment	CO Attainment
	No: of attempts $\geq 60\%$	31		31		
Π	Total Attempts	31	3	31	3	3
	% of attempts $\geq 60\%$	100		100		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

Sem II	PO1	PO2	PO3	PO4
CO1	3			
CO2		3		
CO3				3
CO4		3		
CO5			3	
CO6	3			3

% of attempts >= 60%	Level of Attainment		
>=80 %	3	High	
>70 to <80 %	2	Medium	
60-70 %	1	Low	

Program: B.Sc. (H) Botany Course Name: ANATOMY OF ANGIOSPERMS Course Code: 32161301 Semester III

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
19026556001	KAPIL GARG	24	10	95
19026556002	SOUMYA SINGH	25	9	85.5
19026556003	SANDRA S. P.	22	8	76
19026556004	BANITA GAWARIA	24	8	76
19026556005	DIYA SHARMA	24	9	85.5
19026556006	ARADHYA PANWAR	24	9	85.5
19026556007	B. GOPAL	24	9	85.5
19026556008	KABALAPALLY JAGAN	23	7	66.5
19026556009	KHATRAVATH AJAY	23	8	76
19026556010	SIMRAN CHAUHAN	23	9	85.5
19026556012	BOKKA PRAVARDHAN	23	9	85.5
19026556013	NAVEEN	24	8	76
19026556014	DIVITA	24	9	85.5

19026556015	SIMRAN MORAL	22	8	76
19026556016	DEVIKA K. V.	24	10	95
19026556017	PRAGYA	24	9	85.5
19026556018	ARVIND KUMAR VAISHNAV	23	8	76
19026556019	NITIKA	24	9	85.5
19026556021	PERRY WINKLE	25	9	85.5
19026556022	NIKHILA KUNNUTHOTTIYIL	24	10	95
19026556023	ABHAY BANYAL	24	9	85.5
19026556024	MANASVI CHATURVEDI	25	9	85.5
19026556025	AKANKSHA KUSHWAHA	24	9	85.5
19026556026	RANIA RAZAK KUNHIPARAMBATH	21	9	85.5
19026556027	SIYA DEONIAN	24	9	85.5
19026556028	KASHISH GANGASH	23	9	85.5
19026556029	PRACHI SHARMA	24	10	95
19026556030	NIHARIKA SINGH	24	9	85.5
19026556031	ROHAN YADAV	23	9	85.5
19026556032	VASUPRIYA	24	9	85.5
19026556033	MOHAMMED SANEEN P	23	8	76

Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
	_		Attainment		Attainment	CO Attainment
	No: of attempts $\geq 60\%$	31		31		
III	Total Attempts	31	3	31	3	3
	% of attempts $\geq 60\%$	100		100		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

Sem III	PO1	PO2	PO3	PO4
CO1	3			
CO2		3		
CO3			3	

% of attempts >= 60%	Level of Attainment		
>=80 %	3	High	
>70 to <80 %	2	Medium	
60-70 %	1	Low	

Program: B.Sc. (H) Botany Course Name: MOLECULAR BIOLOGY Course Code: 32161401 Semester IV

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
19026556001	KAPIL GARG	22	10	95
19026556002	SOUMYA SINGH	23	9	85.5
19026556003	SANDRA S. P.	22	9	85.5
19026556004	BANITA GAWARIA	23	10	95
19026556005	DIYA SHARMA	23	10	95
19026556006	ARADHYA PANWAR	21	9	85.5
19026556007	B. GOPAL	23	9	85.5
19026556008	KABALAPALLY JAGAN	20	9	85.5
19026556009	KHATRAVATH AJAY	20	9	85.5
19026556010	SIMRAN CHAUHAN	23	10	95
19026556012	BOKKA PRAVARDHAN	21	9	85.5
19026556013	NAVEEN	20	9	85.5
19026556014	DIVITA	20	9	85.5
19026556015	SIMRAN MORAL	21	9	85.5
19026556016	DEVIKA K. V.	24	10	95
19026556017	PRAGYA	24	9	85.5
19026556018	ARVIND KUMAR VAISHNAV	21	9	85.5
19026556019	NITIKA	22	10	95

19026556021	PERRY WINKLE	25	10	95
	NIKHILA		9	
19026556022	KUNNUTHOTTIYIL	23	,	85.5
19026556023	ABHAY BANYAL	24	10	95
	MANASVI		10	
19026556024	CHATURVEDI	25	10	95
	AKANKSHA		9	
19026556025	KUSHWAHA	22	2	85.5
	RANIA RAZAK		9	
19026556026	KUNHIPARAMBATH	22	7	85.5
19026556027	SIYA DEONIAN	24	10	95
19026556028	KASHISH GANGASH	25	10	95
19026556029	PRACHI SHARMA	22	10	95
19026556030	NIHARIKA SINGH	23	9	85.5
19026556031	ROHAN YADAV	23	9	85.5
19026556032	VASUPRIYA	24	9	85.5
19026556033	MOHAMMED SANEEN P	20	9	85.5

Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
	_		Attainment		Attainment	CO Attainment
	No: of attempts $\geq 60\%$	31		31		
IV	Total Attempts	31	3	31	3	3
	% of attempts $\geq 60\%$	100		100		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

Sem IV	PO1	PO2	PO3	PO4
CO1	3	3		
CO2	3		3	
CO3		3		3

% of attempts >= 60%	Level of Attainment	
>=80 %	3	High
>70 to <80 %	2	Medium
60-70 %	1	Low

Program: B.Sc. (H) Botany Course Name: Reproductive Biology of Angiosperms Course Code: 32161501 Semester V

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
19026556001	KAPIL GARG	24	10	95
19026556002	SOUMYA SINGH	18	10	95
19026556003	SANDRA S. P.	17	9	85.5
19026556004	BANITA GAWARIA	24	10	95
19026556005	DIYA SHARMA	24	9	85.5
19026556006	ARADHYA PANWAR	22	10	95
19026556007	B. GOPAL	21	9	85.5
19026556008	KABALAPALLY JAGAN	18	9	85.5
19026556009	KHATRAVATH AJAY	21	8	76
19026556010	SIMRAN CHAUHAN	21	9	85.5
19026556012	BOKKA PRAVARDHAN	19	10	95
19026556013	NAVEEN	22	9	85.5
19026556014	DIVITA	23	9	85.5
19026556015	SIMRAN MORAL	16	10	95
19026556016	DEVIKA K. V.	20	10	95

19026556017	PRAGYA	23	10	95
19026556018	ARVIND KUMAR VAISHNAV	22	9	85.5
19026556019	NITIKA	22	9	85.5
19026556021	PERRY WINKLE	19	10	95
19026556022	NIKHILA KUNNUTHOTTIYIL	23	9	85.5
19026556023	ABHAY BANYAL	23	9	85.5
19026556024	MANASVI CHATURVEDI	24	10	95
19026556025	AKANKSHA KUSHWAHA	24	10	95
19026556026	RANIA RAZAK KUNHIPARAMBATH	19	9	85.5
19026556027	SIYA DEONIAN	23	9	85.5
19026556028	KASHISH GANGASH	22	9	85.5
19026556029	PRACHI SHARMA	21	10	95
19026556030	NIHARIKA SINGH	9	9	85.5
19026556031	ROHAN YADAV	21	9	85.5
19026556032	VASUPRIYA	21	9	85.5
19026556033	MOHAMMED SANEEN P	22	9	85.5

Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
	_		Attainment		Attainment	CO Attainment
	No: of attempts $\geq 60\%$	30		31		
V	Total Attempts	31	3	31	3	3
	% of attempts $\geq 60\%$	96.77		100		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

Sem V	PO1	PO2	PO3	PO4
CO1			3	
CO2	3			
CO3		3		
CO4			3	
CO5		3		
CO6		3		

% of attempts >= 60%	Level of Attainment	
>=80 %	3	High
>70 to <80 %	2	Medium
60-70 %	1	Low

Program: B.Sc. (H) Botany Course Name: PLANT METABOLISM Course Code: 32161601 Semester VI

Roll No.	Name	Internal Assessment Out of 25	University Exam. Out of Scale 10	University Exam. (Percentage = scale 10*9.5)
19026556001	KAPIL GARG	22	10	95
19026556002	SOUMYA SINGH	22	9	85.5
19026556003	SANDRA S. P.	20	7	66.5
19026556004	BANITA GAWARIA	24	10	95
19026556005	DIYA SHARMA	22	9	85.5
19026556006	ARADHYA PANWAR	22	9	85.5
19026556007	B. GOPAL	22	7	66.5
19026556008	KABALAPALLY JAGAN	14	5	47.5
19026556009	KHATRAVATH AJAY	16	7	66.5
19026556010	SIMRAN CHAUHAN	22	9	85.5
19026556012	BOKKA PRAVARDHAN	15	5	47.5
19026556013	NAVEEN	17	9	85.5
19026556014	DIVITA	22	9	85.5
19026556015	SIMRAN MORAL	16	9	85.5
19026556016	DEVIKA K. V.	22	9	85.5
19026556017	PRAGYA	22	9	85.5

19026556018	ARVIND KUMAR VAISHNAV	19	9	85.5
19026556019	NITIKA	18	8	76
19026556021	PERRY WINKLE	23	8	76
19026556022	NIKHILA KUNNUTHOTTIYIL	21	9	85.5
19026556023	ABHAY BANYAL	24	10	95
19026556024	MANASVI CHATURVEDI	24	10	95
19026556025	AKANKSHA KUSHWAHA	22	9	85.5
19026556026	RANIA RAZAK KUNHIPARAMBATH	20	8	76
19026556027	SIYA DEONIAN	23	9	85.5
19026556028	KASHISH GANGASH	23	9	85.5
19026556029	PRACHI SHARMA	23	10	95
19026556030	NIHARIKA SINGH	16	6	57
19026556031	ROHAN YADAV	17	9	85.5
19026556032	VASUPRIYA	23	10	95
19026556033	MOHAMMED SANEEN P	15	5	47.5

Sem	Attempts	Internal Assessment	Level of	University Examination	Level of	*Overall
	_		Attainment		Attainment	CO Attainment
	No: of attempts $>= 60\%$	30		27		
VI	Total Attempts	31	3	31	3	3
	% of attempts >= 60%	96.77		87.09		

*Overall Attainment = (20% of Internal Assessment Attainment + 80% of University Examination Attainment)

	PO1	PO2	PO3	PO4
CO1			3	
CO2	3			3
CO3			3	

% of attempts >= 60%	Level of Attainment	
>=80 %	3	High
>70 to <80 %	2	Medium
60-70 %	1	Low

Sem	Code	POs Course	PO1	PO2	PO3	PO4
Ι	32161101	MICROBIOLOGY AND PHYCOLOGY	3	3	3	
Π	32161201	MYCOLOGY AND PHYTOPATHOLOGY	3	3	3	3
ΠΙ	32161301	ANATOMY OF ANGIOSPERMS	3	3	3	
IV	32161401	MOLECULAR BIOLOGY	3	3	3	3
v	32161501	Reproductive Biology of Angiosperms	3	3	3	
VI	VI 32161601 PLANT METABOLISM		3		3	3
	Overall			3	3	3

<u>Program level CO-PO matrix of one course from each semester:</u>



	Assessment Methods	Weightage 1	Weightage 2	Remarks	
DIRECT	University Examination	80%		Assessment through Cos attainment	
ASSESSMENT	Assignments Internal Examination	20%	80%		
INDIRECT ASSESSMENT	Exit Survey	100%	20%	Direct evaluation to POs	

		Score					No: of		
S. No.	Question	Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)	POs	Attempts >=60% of Excellent Score	Total No. of Attempts
1	Syllabus is need based and suitable to the course.	14	12	3	2	-	PO1	29	31
2	The curriculum provides options for continuous assessment through quiz and exams	15	9	4	3	-	PO4	28	31
3	Curriculum developed and implementation have relevance to the local and national care needs	5	11	14	1	-	PO3	30	31
4	The curriculum contains sufficient elective papers	8	18	4	1	-	PO3	30	31
5	The curriculum facilitates adequate self-learning.	2	12	15	2	-	PO1	29	31
6	The curriculum provides the ability to express thoughts and ideas effectively in writing and orally.	19	8	4	-	-	PO2	31	31
7	The curriculum provides experiential learning through student seminar, group discussion, projects, field visits.	5	7	16	2	1	PO4	28	31

Indirect PO Assessment (Through Exit Survey)

Indirect PO Assessment (Attainment Through Survey)

	PO1	PO2	PO3	PO4
No: of Attempts >=60% of Excellent Score	29	31	30	28
Total No. of Attempts	31	31	31	31
% of attempts >= 60%	93.54	100	96.77	90.32
Attainment	3	3	3	3

PO ATTAINMENT LEVEL:

	PO1	PO2	PO3	PO4
*PO Attainment	3	3	3	3
Direct Attainment	3	3	3	3
Indirect Attainment	3	3	3	3

*PO Attainment = (80% of Direct Attainment + 20% of Indirect Attainment)

% of attempts >= 60%	Level of Attainment			
>=80 %	3	High		
>70 to <80 %	2	Medium		
60-70 %	1	Low		