

GOVERNMENT ARTS COLLEGE (Autonomous),
(Re-accredited with 'A' Grade by NAAC and Affiliated to Bharathidasan University, Tiruchirappalli)

KARUR - 639 005.



UG
COURSE STRUCTURE

Course Structure under CBCS System

(Applicable to the Candidates admitted from the Academic Year **2021 - 2022** onwards)

B.Sc.,
BOTANY



GOVERNMENT ARTS COLLEGE (Autonomous), KARUR - 639 005
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Course structure under CBCS system

UNDERGRADUATE COURSES

ABOUT THE DEPARTMENT OF BOTANY

About UG program

UG - Program was started in the year 1971. Course structure of the syllabus framed based on the affiliated Bharathidasan University pattern. Number of papers, mark allotment, teaching hours are decided by the Board of studies, every once three years it is updated. Since this is choice based credit system students can choose elective papers on their own choice, and students can move other departments for their Non major elective papers. Syllabi are highly job oriented. The topic or content of the syllabi are chooses by subject experts, members of Board of studies from University and other Colleges. Students are given hands on training during the practical hours. To improve their Knowledge.

GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

VISION

It is our vision to persuade every mind in this temple of learning to tirelessly seek the truth to face the challenges of the times and honestly participate in the establishment of universal peace, progress and love.

MISSION

It is our mission to create in everyone an honest searching mind to be ready for value-based creative citizenship for regional, national and global peace and progress.

DEPARTMENT OF BOTANY

VISION

Provide Skill oriented quality education of Botany to the students for contributing in the process of social development.

MISSION

Offer wide and relevant education to the students through research and teaching with view of shaping their scientific temperament and environmental awareness.

Objectives:

1. To behave with the highest level of honesty.
2. To encourage the innovative ideas and approaches both in Teaching and Research.
3. To create the safe and sustainable environment.
4. To uplift the students capable of facing challenges in life efficiently and carve their own future.
5. To introduce students to modern ideas and thoughts for sustaining in global level.

What is Credit system?

Weightage to a course is given in relation to the hours assigned for the course. The following Table shows the correlation between credits and hours. However, there could be some flexibility because of practical, field visits, tutorials and nature of project work.

For UG courses, a student must earn a minimum of **140 (+4)** credits as mentioned in the table below. The total number of minimum courses offered by a department is given in the course pattern.

UNDER GRADUATE COURSE PATTERN (2021 ONWARDS)

PART	SEMESTER	SPECIFICATION	NO. OF COURSES	HOURS	CREDITS	TOTAL CREDITS
I	I - IV	Part I	4	22	12	24
II	I - IV	Part II	4	22	12	
III	I - VI	Core courses Theory	9	49	42	92
	I - IV	Core courses Practical	8	23	17	
	I - IV	Allied Course Theory	4	20	12	
	I - IV	Allied Course Practical	4	8	8	
	V - VI	Elective Course	3	15	13	
IV	I	Value Education	3	6	6	22 + (4)
	II	Environmental Studies				
	V	Soft Skills Development				
	I	Value Added Course (CLP)	2	4	(2)	
	III	Extra Credit Course Massive Open Online Course (MOOC)	1	-	(2)	
	III - IV	Non Core Elective	2	4	4	
V	VI	Gender Education	1	-	1	2
		Extension Activities	1	1	1	
TOTAL				180	140 + (4)	140 + (4)

Course Pattern

The Undergraduate degree course consists of five vital components. They are as follows:

Part - I: Language (Tamil)

Part - II: General English

Part - III: Core Course (Theory) Allied, Core Electives)

Part - IV: Value Education, Value Added Course, Extra Credit Course, Environmental Studies, Non Core Elective and Soft Skills Development.

Part - V: Gender Education and Extension Activities (NSS, NCC, Sports and Games, PEC, FAPA, YRC, RRC, RC, LC and CC).

Core Courses

A core course is the course offered by the parent department related to the major subjects, components like theories, practical's, Project work, field visits and etc.

Noncore elective

Noncore elective Core should be shared by the various Departments of college. This course should be opted by all the students belonging to the particular Department. Each department of the respective college should allocate themselves the schedule and the units of the course.

Core Elective

The core elective course is also offered by the parent department. The objective is to provide choice and flexibility within the department. There are THREE core electives. They are offered in different semesters according to the choice of the college.

Extra Credit Courses

In order to facilitate the students gaining extra credits, the extra credit courses are given. There are two extra credit courses - Massive Open Online Courses (MOOC) and Skill-based Course - offered in the III and V Semesters respectively. According to the guidelines of UGC, the students are encouraged to avail this option of enriching by enrolling themselves in the MOOC provided by various portals such as SWAYAM, NPTEL, etc. Skill based course is offered by the department apart from their regular class hours.

Value Education Courses

There are four courses offered in the first semesters for the First year students.

Non-Major Elective / Skill Based Elective

These courses are offered in two perspectives as electives "Within college".

Subject Code Fixation

The following code system (11 characters) is adopted for Under Graduate courses:

Year of Revision	UG Code of the Dept	Semester	Specification of Part	Running number in the part
↓	↓	↓	↓	↓
21	U21	x	x	xx
21	UBO	1	x	1

For example:

I BSc, BOTANY- PHYCOLOGY AND BRYOLOGY,

The code of the paper is **U21 BO 1C1**.

Thus, the subject code is fixed for other subjects.

EXAMINATION

Continuous Internal Assessment (CIA):

UG - Distribution of CIA Marks	
Passing Minimum: 40 Marks	
Theory CIA Maximum = 25	Theory CIA Minimum = 10
Practical CIA Maximum = 40	Practical CIA Minimum = 16

End - Semester Tests

Centralized - Conducted by the office of Controller of Examinations.

Semester Examination

Testing with Objective and Descriptive questions.

Section - A: 10 Questions x 2 Marks = 20 Marks (No Choice - Two questions from each unit)

Section - B: 5 Questions x 5 Marks = 25 Marks (Either... or Type - One pair from each unit)

Section - C: 3 Questions x 10 Marks = 30 Marks (3 Out of 5 - One question from each unit)

Duration of Examination:

3- Hours examination for courses.

Grading System

1. Grading

Once the marks of the CIA and the end-semester examination for each of the courses are available, they will be added. The marks thus obtained, will then be graded as per the scheme provided in Table 1.

From the second semester onwards the total performance within a semester and the continuous performance starting from the first semester are indicated by **Semester Grade Point Average (GPA)** and **Cumulative Grade Point Average (CGPA)**, respectively. These two are calculated by the following formulae

$$\text{GPA} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i} \quad \text{WAM (Weighted) Average Marks} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}$$

Where, 'C_i' is the Credit earned for the Course - i,

'G_i' is the Grade Point obtained by the student for the Course 'i'.

'M' is the marks obtained for the course 'i', and

'n' is the number of Courses **Passed** in that semester.

CGPA: Average GPA of all the Courses starting from the first semester to the current semester.

2. Classification of Final Results

- i) For each of the three parts, there shall be separate classification on the basis of the CGPA, as indicated in the following Table - 2.
- ii) For the purpose of Classification of Final Results, the Candidates who earn CGPA 9.00 and above shall be declared to have qualified for the Degree as 'Outstanding'. Similarly, the candidates who earn the CGPA between 8.00 - 8.99, 7.00 - 7.99, 6.00 - 6.99 and 5.00 - 5.99 shall be declared to have qualified for their Degree in the respective programmes as 'Excellent', 'Very Good', 'Good' and 'Above Average' respectively.
- iii) Absence from an examination shall not be taken as an attempt.

Table - I - Grading of the Courses

Marks Range	Grade Point	Corresponding Grade
90 and above	10	O
80 and above but below 90	9	A+
70 and above but below 80	8	A
60 and above but below 70	7	B+
50 and above but below 60	6	B
40 and above but below 50	5	C
Below 40	0	RA

Table - 2 - Final Result

CGPA	Classification of Final Results	Corresponding Grade
9.00 and above	O	Outstanding
8.00 to 8.99	A+	Excellent
7.00 to 7.99	A	Very Good
6.00 to 6.99	B+	Good
5.00 to 5.99	B	Above Average
4.00 to 4.99	C	Average
Below 4.00	RA	Re – Appearance

Credit based weighted Mark System is adopted for individual semesters and cumulative semesters in the column 'Marks Secured' (for 100).

Declaration of Result:

Mr./Ms. _____ has successfully completed the Under Graduate in _____ programme. The candidate's Cumulative Grade Point Average (CGPA) in Part - III is _____ and the class secured is _____ by completing the minimum of **140** credits. The candidate has acquired _____ (if any) extra credits offered by the parent department courses.



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PG AND RESEARCH DEPARTMENT OF BOTANY

B.Sc., BOTANY

(For the candidates admitted from the year 2021-2022 onwards)

Programme Outcome (POs)

- To understand knowledge about, the plants and their economic value.
- To make awareness about, the natural resources and environment.
- To impart knowledge about the chemical and phytochemical aspects.
- To understand the physiology, anatomy and diseases of plants and animals.
- To build knowledge about the importance of higher education.

Programme Specific Outcomes (PSOs)

- To impart knowledge on self-employment opportunity skills in edible mushroom cultivation, biofertilizers production, seedling and horticulture techniques.
- To understand the employment opportunities in teaching, clinical and environment protection agencies.
- To understand, the chemical oriented analytical techniques.
- To understand about communicable diseases and their diagnosis both in plants and animals.



GOVERNMENT ARTS COLLEGE (AUTOMOUS): KARUR - 639 005

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COURSE STRUCTURE UNDER CBCS SYSTEM

(For the candidates admitted from the year 2021-22 onwards)

B.Sc., BOTANY

SEMESTER	PART	COURSE	COURSE TITLE	COURSE CODE	INSTR. HOURS WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL MARKS
								INT	ESE	
I	I	Tamil - I	Tamil - I	U21L1T1	5	3	3	25	75	100
	II	English - I	English - I	U21L1E1	5	3	3	25	75	100
	III	Core Course - I	Phycology and Bryology	U21BO1C1	6	5	3	25	75	100
		Core Course - II	Practical - I (Covering CC - I and CC - III)	-	3	-	-	-	-	-
		First Allied Course-I	Allied Chemistry - I	U21CH1A1	5	3	3	25	75	100
	First Allied Course - II	Allied Chemistry - II (Practical)	-	2	-	-	-	-	100	
	IV	Value Education	Value Education	U21VE1	2	2	3	25	75	
		Value added course	CLP/SAP (Special Assistance Programme) SAP Applicable for B.Sc.(CS) & B.Com (CA)		2	-				
					30	16				500
II	I	Tamil - II	Tamil - II	U21L2T2	5	3	3	25	75	100
	II	English - II	English - II	U21L2E2	5	3	3	25	75	100
	III	Core Course - II	Practical - I (covering CC - I and CC - III)	U21BO2C2P	3	4	3	40	60	100
		Core Course - III	Mycology, Lichenology And Plant Pathology	U21BO2C3	6	5	3	25	75	100
		First Allied Course - II	Allied Chemistry - II (Practical)	U21CH2A2P	2	4	3	40	60	100
	First Allied Course - III	Allied Chemistry - III	U21CH2A3	5	3	3	25	75	100	
	IV	Environmental Studies	Environmental Studies	U21ES2	2	2	3	25	75	100
		Value added course	CLP/SAP (Special Assistance Programme) SAP Applicable for B.Sc.(CS) & B.Com (CA)		2	(2)				
					30	24				700
III	I	Tamil - III	Tamil - III	U21L3T3	6	3	3	25	75	100
	II	English - III	English - III	U21L3E3	6	3	3	25	75	100
	III	Core Course - IV	Cytology, Anatomy and Embryology.	U21BO3C4	6	5	3	25	75	100
		Core Course - V	Practical - II (covering CC - IV and CC - VI)	-	3	-	-	-	-	-
		Second Allied Course - I	Allied Zoology - I	U21ZO3A1	5	3	3	25	75	100
	Second Allied Course - II	Allied Botany - II (Practical)		2	-	-	-	-	-	
	IV	Non Core Elective - I	Nutrition And Dietetics	U21ZO3N1	2	2	3	25	75	100
		Extra Credit Course	Massive Open Online Course (MOOC's)			(2)				
					30	16				500

IV	I	Tamil - IV	Tamil - IV	U21L4T4	6	3	3	25	75	100
	II	English - IV	English - IV	U21L4E4	6	3	3	25	75	100
	III	Core Course - VI	Pteridophytes, Gymnosperms And Palaeobotany	U21BO4C6	5	5	3	25	75	100
		Core Course - V	Practical - II (Covering CC - IV and VI)	U21BO4C5P	2	4	3	40	60	100
		Second Allied Course - II	Allied Zoology Practical - II	U21ZO4A5P	2	4	3	40	60	100
		Second Allied Course - III	Allied Zoology - III (Commercial Zoology)	U21ZO4A6	5	3	3	25	75	100
	IV	Skill Based Elective - I	Mushroom Cultivation	U21BO4S1	2	4	3	25	75	100
		Non Core Elective - II	Communicable Diseases And Management	U21ZO4N2	2	2	3	25	75	100
					30	28				800
V	III	Core Course - VII	Genetics And Evolution	U21BO5C7	5	5	3	25	75	100
		Core Course - VIII	Taxonomy of Angiosperm	U21BO5C8	5	4	3	25	75	100
		Core Course - IX	Plant Ecology and Biodiversity Conservation	U21BO5C9	4	3	3	25	75	100
		Core Course - X	Practical - III (Covering CC - VII and CC - VIII)	-	3	-	-	-	-	-
		Core Course - XI	Practical - IV (Covering CC - XII and CC - XIII)		3	-	-	-	-	-
	IV	Elective Course - I	Biostatistics, Computer Application And Bioinformatics	U21BO5E1	4	4	3	25	75	100
		Skill Based Elective - II	Herbal Technology	U21BO5S2	2	4	3	25	75	100
		Skill Based Elective - III	Plant Tissue Culture	U21BO5S3	2	4	3	25	75	100
		Soft Skills Development	Soft Skills Development	U21SSD3	2	2	3	25	75	100
					30	26				700
VI	III	Core Course - X	Practical - III (Covering CC - VII, CC - VIII and CC - IX)	U21BO6C10P	3	4	3	40	60	100
		Core Course - XI	Practical - IV (Covering CC - XII and CC - XIII)	U21BO6C11P	3	5	3	40	60	100
		Core Course - XII	General Microbiology	U21BO6C12	6	5	3	25	75	100
		Core Course - XIII	Biophysics, Biochemistry And Plant Physiology	U21BO6C13	6	5	3	25	75	100
	IV	Elective Course - II	Biofertilizers And Biopesticides	U21BO6E2	5	5	3	25	75	100
		Elective Course - III	Plant Biotechnology	U21BO6E3	6	4	3	25	75	100
	V	Gender Studies	Gender Studies	U21EA4	1	1	3	25	75	100
		Extension Activities	Extension Activities (NSS/ NCC/ RRB/YRC/Fine Arts/Environmental Education/ Population Education Club/ Retract Club/ Leo Club/ Consumer Club/ Sports &Games)	-	-	1				
				30	30				700	
TOTAL					180	140 +	(4)			3900

CHAIRMAN
BOARD OF STUDIES IN BOTANY

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO1C1
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - I SEMESTER - CORE COURSE - I (For the candidates admitted from the year 2021-22 onwards) PHYCOLOGY AND BRYOLOGY	
COURSE OBJECTIVES:	
<ol style="list-style-type: none"> 1. To understand the major groups of lower plants and their characteristics. 2. To study the effective utilization of Algae. 3. To study the effective utilization of Fungi. 	
PHYCOLOGY:	
UNIT - I	Fritsch Classification (1935 - 1945). General characteristics and Thallus organization of Algae, Economic importance of Algae.
UNIT - II	Structure, Reproduction, and life history of the following types: Notec, Chlamydomonas, Volvox, Oedogonium, Caulerpa.
UNIT - III	Structure, Reproduction, and life history of the following types: Vaucheria, Dictyota, Sargassum and Polysiphonia.
BRYOLOGY:	
UNIT - IV	E.V. Watson (1981) Classification. General characteristics, Evolution of Gametophytes and Sporophytes, Economic importance of Bryophytes.
UNIT - V	Structure, Reproduction and life history of the following types - <i>Riccia</i> , <i>Marchantia</i> , <i>Anthoceros</i> .
Text Book:	
<ol style="list-style-type: none"> 1. Sing, V.Pande, P.C.Jain, D.K. (2010) - A text book of Botany - Rastogi Publications, Meerut. 	
Reference Books:	
Phycology:	
<ol style="list-style-type: none"> 1. Vashista R.C. (2001) - Botany for degree students - S.Chand and co (P) Ltd., New Delhi. 2. Sharma, O.P. (2011). Diversity of microbes & Cryptogams - Algae, Tata McGraw Hill Education Private Limited, New Delhi. 3. Lee, R. E. (2008) Phycology - IV Edition, Cambridge University Press, New Delhi. 4. Rashid.A. 2007. An Introduction to Bryophyta - Vikas publications, New Delhi. 5. Sambamurthy A.V.S.S. 2005. A Textbook of Algae. I.K. International Pvt. Ltd, New Delhi. 6. Fritsch F.F. (1935) the structure and reproduction of the Algae volume I & II. Tata McGraw Hill Edu. Private Limited, New Delhi. 	
Bryology :	
<ol style="list-style-type: none"> 1. Smith, G.M. 1955 - Cryptogamic Botany Vol. II (Bryophytes & Pteridophytes) Tata Mcgraw Hill Publishing Co. New Delhi. 2. Rashid.A. 2007. An Introduction to Bryophyta - Vikas publications, New Delhi. 3. Chandrakant Pathak, 2003. The latest portfolio of theory & practice in Bryophyta, Dominant publications. New Delhi. 4. Chopra, R.N. and P.K. Kumar, 2003. Biology of Bryophytes, New age International Pvt. ltd., New Delhi. 5. Vashishta, Sinha A.K, Adarsh Kumar. (2011). Bryophytes, S.Chand &Company ltd., New Delhi. 	

Course outcomes

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

1. Students acquire knowledge about basics of Algae and Bryophytes.
2. Know about the systematic position of algae and bryophytes.
3. Illustrates Structural features of algae and Bryophytes.
4. Understand the economic value of algae and bryophytes.

Nature of Course

Knowledge and skill	✓	Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	3	3	3	3	4	3	2	3	3	3.0
CO2	3	4	4	3	4	2	3	2	3	3.1
CO3	4	4	3	3	4	3	4	3	3	3.4
CO4	4	4	3	4	4	2	3	3	3	3.3
Mean Overall Score										3.2

Result: The Score for this course is 3.2 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = $\frac{\text{-----}}{\text{Total No. of Pos \& PSOs}}$	Mean overall score for COs = $\frac{\text{-----}}{\text{Total No. of COS}}$

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO2C2P
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR – 639005 B.Sc., BOTANY - II SEMESTER - CORE COURSE - II (For the candidates admitted from the year 2021-22 onwards) PRACTICAL - I (COVERING CC - I & CC - III) (PHYCOLOGY, BRYOLOGY, MYCOLOGY AND PLANT PATHOLOGY)	

COURSE OBJECTIVES:

1. To have a broad knowledge about the primitive type of plants and their characteristics.
2. To study the morphology of primitive plants.
3. To understand the basic principles related to plant diseases.

PHYCOLOGY :

1. To make suitable micropreparation of the following type study:
i) *Sargassum* ii) *Caulerpa* iii) *Gracilaria*.
2. To identify micro specimen relevant to the syllabus: *Chlamydomonas, Volvox, Diatoms and Polysiphonia*.
3. To identify micro slides relevant to the syllabus: *Oedogonium, Dictyota, Voucheria and Nostoc*.

MYCOLOGY AND PLANT PATHOLOGY :

1. A study of vegetative, Reproductive and micro preparation of following genera:
i) *Albugo* ii) *Peziza* iii) *Cercospora*.
2. Lichens (Crustose, Foliose and Fruiticose).
3. To identify micro slides relevant to the syllabus: *Penicillium, yeast and Aspergillus*.
4. Study the name of the disease, pathogen, symptoms and control measures of following Diseases:
i) Tobacco Mosaic ii) Citrus canker iii) Rice blight iv) Tikka disease of groundnut.
5. To maintain the record note.

Course outcomes

1. To study the internal structures of lower plant groups.
2. To compare the external and internal structure of the plants.
4. To understand the mode of action in disease cycle.
5. To apply the practical knowledge to the field.

Mapping Course Outcome with PO and PSO

Course Outcomes (Cos)	Programme Outcomes (Pos)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	2	3	3	4	2	2	3	2	2.7
CO2	4	3	3	3	2	2	2	2	3	2.6
CO3	4	2	3	4	3	4	3	3	4	3.3
CO4	4	4	4	3	4	4	4	3	3	3.6
Mean Overall Score										3.05

Result: The Score for this course is 3.5 (High Relationship)

Note:

Mapping	1 – 20%	21 – 40%	41 – 60%	61 – 80%	81 – 100%
Scale	1	2	3	4	5
Relation	0.0 – 1.0	1.1 – 2.0	2.1 – 3.0	3.1 – 4.0	4.1 – 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of Cos = ----- Total No. of Pos & PSOs	Mean overall score for Cos = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO2C3
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - II SEMESTER - CORE COURSE - III (For the candidates admitted from the year 2021-22 onwards) MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY	
COURSE OBJECTIVES:	
<ol style="list-style-type: none"> 1. To study the morphology of fungi. 2. To study the fungi and plant interactions. 3. To study the life cycle patterns of fungi and lichen. 	
MYCOLOGY	
UNIT- I	General features, occurrence and distribution. Mode of nutrition in fungi - Classification of fungi (Alexopoulos and Mims, 1979). General characters of major classes: Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina and Deuteromycotina. Economic importance of fungi - Medicine and Industries.
UNIT - II	Homothallism and Heterothallism in fungi. Reproduction, life cycle types, reduction in sexuality in fungi. Spore dispersal mechanisms and fungal genetics - Fossil fungi.
LICHENOLOGY	
UNIT - III	General features of lichen. Classification (Miller, 1984). Distribution, thallus organization, vegetative and sexual reproduction, lichens as indicators of pollution and economic importance.
PLANT PATHOLOGY	
UNIT - IV	Plant pathology - Methods of studying plant diseases - common terminologies used in plant pathology - symptomology, Etiology, Epidemic disease, Control measures - Host parasite interactions - Mycotoxins - Aflatoxins, Defense mechanisms in plant - integrated disease management.
UNIT - V	Causative organism, mode of action and control measures of common plant diseases: Tobacco Mosaic, Citrus canker, Rice blight, Tikka disease of groundnut, Downy mildew of grapes, Damping off disease of seedlings, Rust of wheat.
Text Books:	
<ol style="list-style-type: none"> 1. Singh V, Pande PC & Jain DK 2015. A Text Book of Botany (4th ed), Rastogi, Meerut. 2. Johri, R.M., Smeh Lata, Kavitha Tyagi. 2011. A Text Book of Fungi, Dominant Publishers and Distributors Pvt. Ltd., New Delhi. 	
Reference Books:	
Mycology and lichenology:	
<ol style="list-style-type: none"> 1. Alexopoulos, C.J. and Mims, C.W. (2000). Introductory Mycology. Wiley Eastern Ltd., New York. 2. Sharma, O.P. (2011). Fungi and allied microbes The McGraw - Hill companies, New Delhi. 3. Mehrotra, R.S and Aneja, K.R. (1990). An Introduction of Mycology. Wiley Eastern Ltd., New Delhi. 4. Sharma, P.D (2003). The Fungi. Rastogi Publications, Meerut. 5. Vashishta, B.R. and Sinha, A. K. (2007). Botany for Degree Students - Fungi. S. Chand and Co. Ltd., New Delhi. 6. Muthukumar.S. and Tarar.J.L. (2006).Lichen Flora of Central India, Eastern book Corporation, New Delhi. 7. Dharani Dhar Awasthi. (2000). A Handbook of Lichens Vedams eBooks (P) Ltd. New Delhi. 	
Plant Pathology:	
<ol style="list-style-type: none"> 1. Bilgrami, K.S. & H.C.Dube (1990) A text book of Modern Plant Pathology - Vikas Publishing House (P) Ltd., New Delhi. 2. Butler, E.J. and Jones, S.G. (1949). Plant Pathology. Macmillan & Co., London. 3. Cooper.J.I. (1995). Viruses and the Environment. 2nd ed. Chapman & Hall, London. 4. Sambamurthy AV.S.S. 2006. A Textbook of Plant Pathology. I.K. International Pvt. Ltd., New Delhi. 5. Singh. R.S. 2005. Principles of Plant Pathology – 4th edition. Oxford & IBH, New Delhi. 	

Course outcomes

1. To understand the salient features of fungi and lichens.
2. To know the basic skills on etiology and control of various plant diseases.
3. To understand the disease cycle caused by the pathogens.
4. To analyze the ecological importance of lichens.
5. To evaluate the economic importance of fungi and lichens.

Nature of Course

Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (Cos)	Programme Outcomes (Pos)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	2	3	2	3	3	2	2.7
CO2	4	3	4	2	2	4	2	2	3	2.8
CO3	4	4	3	2	4	3	4	2	3	3.2
CO4	4	4	4	3	4	4	4	3	3	3.2
Mean Overall Score										2.94

Result: The Score for this course is 2.94 (High Relationship)

Note:

Mapping	1 – 20%	21 – 40%	41 – 60%	61 – 80%	81 – 100%
Scale	1	2	3	4	5
Relation	0.0 – 1.0	1.1 – 2.0	2.1 – 3.0	3.1 – 4.0	4.1 – 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of Cos = $\frac{\text{-----}}{\text{Total No. of Pos \& PSOs}}$	Mean overall score for Cos = $\frac{\text{-----}}{\text{Total No. of COS}}$

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO3C4
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - III SEMESTER - CORE COURSE - IV (For the candidates admitted from the year 2021-22 onwards) CYTOLOGY, ANATOMY AND EMBRYOLOGY	
COURSE OBJECTIVES:	
<ol style="list-style-type: none"> 1. To study the components of plant cell. 2. To study the internal structures of plant cell. 3. Know the growth and developmental aspects of plant cell. 	
CYTOLOGY:	
UNIT - I	Ultrastructure and Function of Plant Cell: Cell Wall, Cytoplasm, Plasma membrane, Endoplasmic reticulum, Golgi Complex, Lysosomes, Mitochondria, Plastids, Ribosome's and Nucleus.
UNIT - II	Structure, Types and Functions of Chromosomes, DNA and RNA. Cell division; Amitosis, Mitosis and Meiosis. Programmed Cell Death (PCD) - Apoptosis.
ANATOMY:	
UNIT - III	Plant Tissues; Classification. Meristematic Tissue - Cytological characteristics and Types. Simple Tissues - Parenchyma, Collenchyma and Sclerenchyma. Complex Tissues; Xylem and Phloem, Stomatal Types.
UNIT - IV	Primary Structure of Root, Stem and Leaf in Dicots and Monocots. Normal Secondary Growth in Stem and Root. Annual Rings - Heartwood and Sapwood. Anomalous Secondary Growth in Dicots, Ex: Dracaena, Nodal Anatomy - Uni and Trilocular.
EMBRYOLOGY :	
UNIT - V	Structure and development of Anther and Male gametophyte. Structure, development and types of Ovule and Embryo sac (Polygonum type). Double Fertilization. Endosperm: Structure and Types. Development of Embryo in Dicot and Monocot.
Text Books:	
<ol style="list-style-type: none"> 1. Annie Ragland, 2014 - Cytology, Anatomy, Pteridophytes & Gymnosperms - Saras Publication. 2. Verma P.S. and Agarwal, V.K. Cytology, Revised Edition 2010. S.Chand & Co Publication. 3. S.S.Bhojwani and S.P.Bhatnagar - 2009 (Revised Edition) the Embryology of Angiosperms. - Vikas Publishing House, Pvt. Ltd., New Delhi. 	
Reference Books:	
<ol style="list-style-type: none"> 1. Singh.S.P. and Tomar B.S. 2014 - Cell Biology - Rostogi Publications. 10th Revised Edition. 2. Gupta P.K. 2014 - Cell and Molecular Biology. Rostogi Publications. 4th Revised Edition. 3. Rastogi.S.C, 1992. Cell Biology. Tata MCGRAW. Hill publication Co. Ltd, New Delhi. 4. De Robertis, E.D.P and De Robertis E.M.P, 1980. Cell and Molicular Biology (7th edtn.) Holt Sauders International Ed., Publication, Tokyo. 5. Pijushroy, (2010).plant Anatomy, New central Book Agency, Pvt Lit, New Delhi. 6. Easu, K. - Plant Anatomy - John Wiley & Sons. Inc.N.Y. 7. Singh.V. P.C.Pandey and D.K.Jain. 2003. Embryology of Angiosperms. Rastogi Publications. Meerut. 8. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition. 	

Course outcomes

1. To understand structure and functions of the cell.
2. To understand the primary and secondary structure of Monocots and Dicots.
3. To study the internal structure of Angiosperms.
4. To acquire knowledge on the structure and development of Dicot and Monocot embryos.

Nature of Course

Knowledge and skill	✓	Employability oriented	
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	4	4	2	4	4	3	3.4
CO2	3	3	3	3	4	2	4	3	2	3.0
CO3	4	4	3	3	4	2	4	4	2	3.3
CO4	4	2	3	3	4	3	4	2	2	3.0
Mean Overall Score										3.17

Result: The Score for this course is 3.17 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 3	COURSE CODE: U21BO3A4
<p>GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005</p> <p>B.Sc., ZOOLOGY - III SEMESTER - SECOND ALLIED COURSE - I (For the candidates admitted from the year 2021-22onwards)</p> <p>ALLIED BOTANY - I (ALGAE, FUNGI, BRYOPHYTES, PTERIDOPHYTES, ECOLOGY AND EVOLUTION)</p>	
<p>COURSE OBJECTIVES:</p> <ol style="list-style-type: none"> 1. To understand general characters and classification of Thallophytes. 2. To get knowledge about classification, mode of reproduction and detailed study of some important bryophytes. 3. To impart knowledge to general characters, classification and stelar evolution of Pteridophytes. 4. To understand the basic concepts of plant ecology and our surrounding ecosystem. 5. Interpret the concept of Lamarckism and Darwinism. 	
UNIT - I	General characters of Algae. Classification of Algae by Fritsch. Structure and Life history of the following. <i>Chlamydomonas</i> , <i>Volvox</i> , <i>Oscillatoria</i> , <i>Sargassum</i> and <i>Polysiphonia</i> .
UNIT - II	General characters of Fungi. Classification of fungi by Alexopoulos. Structure and Life history of the following <i>Penicillium</i> , <i>Agaricus</i> , <i>Fusarium</i> .
UNIT - III	General characters of Bryophytes, Pteridophytes and Gymnosperms. Structure and Life history of <i>Riccia</i> , <i>Selaginella</i> and <i>Cycas</i> .
UNIT - IV	Geological era, Types of Fossilization - Structure of the following <i>Rhynia</i> , <i>Lepidodendron</i> and <i>Lepidocarpon</i> .
UNIT - V	Ecology and Evolution: Ecological factors - Climatic, Edaphic and Biotic factors. Plant adaption - Hydrophytes, Xerophytes and Halophytes. Origin of Life, Theories of Lamarck and Darwin.
<p>Text Books:</p> <ol style="list-style-type: none"> 1. N.Arumugam, V.Kumarasan and Annie Ragland, 2016. Fungi & Plant Pathology, Saras Publications, Nagercoil. 2. Sambamurthy A.V.S.S. 2005. A Textbook of Algae. I.K. International Pvt. Ltd, New Delhi. 3. Vashishta, Sinha A.K, Adarsh Kumar. (2011) Bryophytes, S. Chand &Company ltd., New Delhi. 	
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Fuller, H.J. and Tippo, 1990 - College Botany - Henry, Holt & Co. New Delhi. 2. Gangully, A.K. General Botany, The New Book Stall, Calcutta, Vol.I, 7th Edt.(1970), Vol.II, 6th Edition (1975). New Delhi. 3. K.N. Rao, K.Krishnamurthy and G.S.Rao. 1979. Ancillary Botany, S.Viswanathan. 4. Nathawat, G.S.P.D. Sharma and R.K.Shani 1977 - A Text Book of Botany, Ramesh Book Depo, Jaipur. 	

Course outcomes**On the completion of this course, the students will be able**

1. Discuss about importance of morphological structure, classification, reproduction and economic importance of algae and fungi.
2. Gain the knowledge about classification, mode of reproduction and detailed study of some important bryophytes, pteridophytes and gymnosperm.
3. Students will be conversant with general characters, morphology and anatomy of *Riccia*, *Selaginella* and *Cycas*.
4. Student gets knowledge in the methods of fossil and fossilization.
5. They know the evolutionary concept and theories.

Nature of Course

Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	3	4	3	2	3	3	2.8
CO2	3	3	3	3	4	3	2	4	3	3.1
CO3	3	3	4	4	3	4	3	3	3	3.3
CO4	4	4	4	3	4	4	4	4	5	4.0
Mean Overall Score										3.30

Result: The Score for this course is 3.30 (High Relationship)**Note:**

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:**CHAIRMAN - BOS****CONTROLLER OF EXAMINATIONS**

NO. OF CREDITS: 2	COURSE CODE: U21BO3N1
<p align="center">GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., ZOOLOGY AND N&D - III SEMESTER - NON CORE ELECTIVE - I (For the candidates admitted from the year 2021-22 onwards) MEDICAL BOTANY</p>	
<p>COURSE OBJECTIVES:</p> <ol style="list-style-type: none"> 1. Students gain adequate knowledge on cultivation, collection, processing and utilization of medicinal plants. 2. To impart knowledge analytical methods, drug adulteration and evaluation of drugs. 3. To get knowledge about pharmaceutical plant products. 4. Students understand various types of secondary metabolites. 5. To impart knowledge about nutraceuticals, cosmoceuticals and immunomodulators of natural products. 	
UNIT - I	Brief history of medicinal plants. Indian system of medicines - Siddha, Ayurvedha and Unani systems. Classification of crude drugs and drug adulteration.
UNIT - II	Cultivation and utilization of the selected medicinal plants - <i>Justica adathoda</i> , <i>Aloe vera</i> , <i>Allium cepa</i> , <i>Ocimum tenuiflorum</i> and <i>Catharathus roseus</i> - Role of National Medicinal Plants Board of India.
UNIT - III	Drugs from Leaves - <i>Atropa belladona</i> , <i>Eucalyptus globules</i> , <i>Datura metal</i> and <i>Cassia auriculata</i> . Flower - <i>Syzygium aromaticum</i> . Roots - <i>Rauwolfia serpentina</i> . Bark - <i>Cinchona officinalis</i> . Stem of wood - <i>Ephedra</i> . Fruits and Seeds - <i>Feronia elephatum</i> and <i>Coriandrum sativum</i> . Underground stem: <i>Zingiber officinale</i> .
UNIT - IV	Drug used to treat disorders of gastrointestinal tract and Cardiac muscles. <i>Digitalis purpurea</i> (<i>Digitoxion</i>), <i>Basella rubra</i> (<i>anti inflammatory</i>).
UNIT - V	Cultivation of medicinal plants in India. Breeding, Methods applied to medicinal herbs, Plant tissue culture as source of drugs.
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Prajapathi, Purohit, Sharma and Kumar (2003) - A hand Book of Medicinal Plants. Agrobios Publications, Jodhpur. 2. Sood, S.K. (2015) - Herbal medicine, Pointer Publishers, Jaipur. 	
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Dhavan, B.N. (1986), Ayurvedic Research on medicinal plants in India INSA, New Delhi. 2. Trivedi, P.C. (2010) - Ethnic Tribes & Medicinal Plants, Pointer Publishers, Jaipur. 3. Amruth, The medicinal plants magazine (All volumes) Medicinal Plants Conservatory society, Bangalore. 4. Baruah, A. (2011) - Aromatic & Spices Plants: Utilization and Conservation - Pointer Publishers, Jaipur. 	

Course outcomes**On the completion of this course, the students will be able**

1. Understand the importance of various nutrients.
2. Have an in-depth knowledge on the physiological processes and metabolism of nutrients.
3. Know the calorific values of different nutrients.
4. Preserve the food materials from contamination.

Nature of Course

Knowledge and skill	✓	Employability oriented	
Skill oriented	✓	Entrepreneurship oriented	✓

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	3	4	4	2	3	4	3.3
CO2	3	4	3	3	3	4	2	3	3	3.1
CO3	4	2	3	4	3	4	3	3	4	3.3
CO4	3	4	4	3	4	4	4	3	3	3.3
Mean Overall Score										3.25

Result: The Score for this course is 3.25 (High Relationship)**Note:**

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:**CHAIRMAN - BOS****CONTROLLER OF EXAMINATIONS**

NO. OF CREDITS: 5	COURSE CODE: U21BO4C6
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - IV SEMESTER - CORE COURSE - VI (For the candidates admitted from the year 2021-22 onwards) PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. It brings basic knowledge to the students about their cryptogams, Tracheophyte and also ecology, evolutionary characters of plants. 2. To Study the anatomical, reproductive features of Cryptogams and Palaeobotany. 3. It brings out the phonological and structural features Gymnosperms and Palaeobotany. 	
PTERIDOPHYTES	
UNIT - I	General characteristics of Pteridophyte. Classification by Sporne, 1970, Stelar evolution, Heterospory and origin of seed habit in Pteridophytes.
UNIT - II	Morphology, Structure, Reproduction and Life history of the following genera <i>Psilotum</i> , <i>Lycopodium</i> , <i>Selaginella</i> and <i>Equisetum</i> .
UNIT - III	Morphology, Structure, Reproduction and Life history of the following genera <i>Ophioglossum</i> , <i>Adiantum</i> and <i>Marsilea</i> .
GYMNOSPERMS	
UNIT - IV	General characteristics of Gymnosperms. Classification by Sporne, 1965. Morphology, Structure and reproduction of following genera - <i>Cycas</i> , <i>Pinus</i> and <i>Gnetum</i> .
PALAEOBOTANY	
UNIT - V	Fossils, Types and methods of fossilization - Geological time scale. A brief study of the following fossil forms - <i>Rhynia</i> , <i>Lepidodendron</i> , <i>Lepidocarpon</i> , <i>Calamites</i> and <i>Williamsonia</i> .
Text Books: <ol style="list-style-type: none"> 1. Arora M. P. (1990). Evolutionary biology, Himalaya Publication House, Delhi. 2. Biswas, C. and Johri, B. M. (2004). The Gymnosperms. Narosa Publishing House, New Delhi. 	
Reference Books: <p>Pteridophytes:</p> <ol style="list-style-type: none"> 1. Sporne, K.R. (1970) - The morphology of pteridophytes (The structure of ferns and allied plants). 2. Singh, V. Pande, P.C. and Jain, D.K - 4th Edition (2014 - 15) - A Text Of Botany, Diversity of Microbes and Cryptogams - Rastogi Publications, Meerut. 3. Vashishta , P.C.Sinha and Anilkumar (2010) Pteridophytes, S. Chand &company Ltd, New Delhi. <p>Gymnosperms :</p> <ol style="list-style-type: none"> 1. Johri, R M, Lata S, Tyagi K (2005), A text book of Gymnosperms, Dominate pub. & Distributer, New Delhi. <p>Palaeobotany:</p> <ol style="list-style-type: none"> 1. A.C. Arnold 2000. An introduction to palaeobotany, Tata McGraw Hill Education Private Limited, New Delhi. 2. Kimura, M. (1983) The natural theory of molecular evolution, Cambridge University Press, Cambridge. 	

Course outcomes

1. It brings basic knowledge to the students about their cryptogams, Tracheophyte and also Ecology, evolutionary characters of plants.
2. Study the anatomical, reproductive features of Cryptogams and Palaeobotany.
3. It brings out the phenological and structural features Gymnosperms and Palaeobotany.

Nature of Course

Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	2	3	3	4	4	2	3	2	3.0
CO2	3	4	3	3	2	4	2	2	3	2.8
CO3	4	2	3	4	3	4	3	3	4	3.0
CO4	3	4	4	3	4	4	4	3	3	3.3
Mean Overall Score										3.02

Result: The Score for this course is 3.02 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO4C5P
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - IV SEMESTER - CORE COURSE - V (For the candidates admitted from the year 2021-22 onwards) PRACTICAL - II (COVERING CC - IV AND CC - VI) (CYTOLOGY, ANATOMY, EMBRYOLOGY, PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY)	
COURSE OBJECTIVES: <ol style="list-style-type: none"> To learn the structure, chemistry and functions of cellular organelles – Meristems. To observe the internal structures through sectionalizing and mounting. To gain knowledge on embryo development and seed formation. To study in structure of pteridophytes and gymnosperms with a help of microscopic preparations. 	
Cytology <ol style="list-style-type: none"> Spotters of cellular organelles – Nucleus, Mitochondria, Chloroplast, Golgi complex, Endoplasmic reticulum (Identification only from electron microphotographs of standard publications). Study of mitosis (squash) using Onion root tip. 	
Anatomy Preparation of microslides – Dicot and monocot stem leaf and root (Primary structure). Secondary structure of Dicot stems and roots – Anomalous growth in <i>Aristolochia</i> , <i>Boerhaavia</i> and <i>Dracaena</i> .	
Embryology Slides showing T.S. of Anther, Types of ovules. Embryo dissection in <i>Tridax</i> .	
Pteridophytes: Preparation of Microslides in the following plants. Transverse sections of <i>Psilotum</i> , <i>Lycopodium</i> , <i>Selasinell</i> and <i>Equisetum</i> stem, <i>Adiantum</i> leaf and <i>Marsilea</i> sporocarp.	
Gymnosperms: Study of morphology and anatomy of the following plants. Transverse section of <i>Cycas</i> leaf and rachis, <i>Pinus</i> needle, <i>Gnetum</i> stem and <i>Cupresus</i> stem. Study and observation of Morphology and Anatomy of following fossil forms <i>Rhynia</i> , <i>Lepidodendron</i> , <i>Lepidocarpon</i> , <i>Calamites</i> and <i>Willamsonia</i> .	
Course outcomes <ol style="list-style-type: none"> It clearly brings out the molecular and anatomical structural features and reproductive nature of plants. Training the students to prepare micropreparation and showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis. Micropreparation of stems, roots and leaf of dicot and monocot. 	

Mapping Course Outcome with PO and PSO

Course Outcomes (Cos)	Programme Outcomes (Pos)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	4	4	4	2	3	3	3.33
CO2	4	2	2	4	4	4	3	3	4	3.33
CO3	3	3	3	3	4	3	3	3	4	3.22
CO4	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-
Mean Overall Score										3.29

Result: The Score for this course is 3.29(High Relationship)

Note:

Mapping Scale	1 – 20%	21 – 40%	41 – 60%	61 – 80%	81 – 100%
Scale	1	2	3	4	5
Relation	0.0 – 1.0	1.1 – 2.0	2.1 – 3.0	3.1 – 4.0	4.1 – 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value Mean Score of Cos = ----- Total No. of Pos & PSOs	Total of Mean Score Mean overall score for Cos = ----- Total No. of COS
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COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO4A5P
GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR - 639005 B.Sc., ZOOLOGY - IV SEMESTER - SECOND ALLIED COURSE - II (For the candidates admitted from the year 2021-22 onwards) ALLIED BOTANY - II PRACTICAL (COVERING SAC - I AND SAC - III)	
COURSE OBJECTIVES: <ol style="list-style-type: none"> To provide basic knowledge about analytical techniques used in plant science. To improve practical skills for higher studies. To inculcate lab - oriented skills among students. To study and get knowledge about parts and working principles of compound and dissecting microscope. 	
<ol style="list-style-type: none"> Micropreparation and Identification of types included in Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. 	
<ol style="list-style-type: none"> Micropreparation of Stem, Root and Leaf of Dicot. 	
<ol style="list-style-type: none"> To make dissection using dissection microscope and study the following families as Per the syllabus. 	
<ol style="list-style-type: none"> Demonstrations: Osmosis, Ganong's photometer, anaerobic respiration, Auxanometer and Clinostat. 	
<ol style="list-style-type: none"> To study the Ecological adaptations - <i>Eichhornia</i>, <i>Opuntia</i> and <i>Avicennia</i>. 	
Course outcomes <ol style="list-style-type: none"> It clearly brings out the molecular and anatomical structural features and reproductive nature of plants. Training the students to prepare micropreparation and showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis. Micropreparation of stems, roots and leaf of dicot and monocot. 	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	3	4	4	2	3	3	3.2
CO2	3	4	3	3	4	4	3	3	3	3.3
CO3	3	3	3	4	3	4	3	3	4	3.3
CO4	3	4	4	3	4	4	4	3	3	3.5
Mean Overall Score										3.32

Result: The Score for this course is 3.32 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value Mean Score of COs = ----- Total No. of Pos & PSOs	Total of Mean Score Mean overall score for COs = ----- Total No. of COS
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COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 3	COURSE CODE: U21BO4A6
GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR – 639005 B.Sc., ZOOLOGY - IV SEMESTER - SECOND ALLIED COURSE - III (For the candidates admitted from the year 2021-22 onwards) ALLIED BOTANY- III (Morphology, Taxonomy, Cytology, Anatomy, Embryology and Plant Physiology)	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To study the morphology of the plant parts. 2. To aware various plant families and its economic importance. 3. To acquire knowledge on ultrastructure of cell. 4. To get knowledge on structure and development plant embryo. 5. To acquire knowledge on the physiological functions of plants. 	
UNIT - I	Plant Morphology: Leaf arrangement and shapes. Types of inflorescence - Racemose, cymose Floral parts.
UNIT - II	Taxonomy: ICBN. Classification by Bentham and Hooker. General Morphological, Recproductive features and economic importance of following families, Annonaceae, Rutaceae, Fabaceae, Apocynaceae, Lamiaceae, Euphorbiaceae, Arecaceae, Poaceae.
UNIT - III	Cytology: Ultra structure of cell. Cell organelles - Endoplasmic reticulum, Golgi complex, Mitochondria, Chloroplast, Nucleus. Mitosis and Meiosis. Genetics: Mendel's law of inheritance- Monohybrid and Di hybrid experiments.
UNIT - IV	Anatomy and Embryology: Meristematic tissues. Primary structure of stem, root and leaf in Dicot. Embryology: Structure of Anther, Structure ovule / embryo sac, Pollination, Fertilization. Endosperm types - nuclear and cellular.
UNIT - V	Plant Physiology: Absorption of water- transpiration and ascent of sap. Absorption of minerals and their role in plant nutrients. Photosynthesis - mechanism light and dark reaction - C3 cycle only, application auxins and giprellins.
Text Books: <ol style="list-style-type: none"> 1. S.S.Bhojwani and S.P.Bhatnagar - 2009 (Revised Edition) the Embryology of Angiosperms. – Vikas Publishing House, Pvt. Ltd., New Delhi. 2. Jain V.K.Fundamentals of Plant physiology. 	
Reference Books: <ol style="list-style-type: none"> 1. Singh, V.D.K 1983. Taxonomy of Angiosperms. Rastogi publication meerut India. 2. Pandey B.P 1997. Taxonomy of Angiosperms. Chand & Co P Ltd, New Delhi. 3. Vasishta P.C 1977. A text book of Plant anatomy. S. Nagin & Company. Jallunder, New Delhi. 4. Singh, V., Pande, P.C. and Jain, D.K. - 4th Revised Edition (2013-14) -A Text Book of Botany, Angiosperms - Rastogi Publications, Meerut. 	

Course outcomes

1. Students have a good overview of morphology of leaf, inflorescence and floral parts.
2. Study the characters and economic importance of selected families.
3. Understand the structure and chemical composition of chromatin and concept of cell division.
4. The students will enable to know the internal structure of stem, leaf and root in monocot and dicot.
5. Students understand the mechanism of photosynthesis and Respiration.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	✓

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	4	3	3	4	3	2	2	2	3.0
CO2	4	3	3	3	2	2	3	4	5	3.2
CO3	4	2	3	4	3	4	4	3	3	3.3
CO4	4	4	4	3	3	4	4	4	4	3.7
Mean Overall Score										3.30

Result: The Score for this course is 3.30 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO4S1
GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR - 639005 B.Sc., BOTANY - IV SEMESTER - SKILL BASED ELECTIVE - I (For the candidates admitted from the year 2021-22 onwards) MUSHROOM CULTIVATION	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To provide an adequate knowledge about mushroom characteristics and their importance 2. Comprehend the lifecycles of various classes of fungi. 3. Understand the knowledge about spawn and spawning techniques. 4. Apply their knowledge in cultivating of mushrooms and their role in human welfare. 5. To gain knowledge about cost economics, importance and preparation of value added products. 	
UNIT - I	INTRODUCTION History, Outlines of Classification, Characteristics and Types of mushrooms. Economic importance, Nutritional value, Edible, Poisonous and Hallucinogenic mushrooms.
UNIT - II	LIFE CYCLE Systematic position, morphology, distribution, structure and life cycle of <i>Volvariella</i> , <i>Agaricus</i> , <i>Pleurotus</i> , <i>Lentinus</i> and <i>Calocybe</i> .
UNIT - III	CULTIVATION TECHNOLOGY Composed preparation, Spawn preparation. Cultivation methods of Button, Oyster and Paddy straw mushroom.
UNIT - IV	DISEASE MANAGEMENT Diseases caused by viruses, bacteria, fungi, termites and insects - control measures. Post harvesting technology - Blanching, steeping, sun drying, pickling, freeze drying and canning - Short term and long term storages.
UNIT - V	BIOLOGICAL IMPORTANCE Medicinal and nutritive value of mushrooms - Important recipes from mushrooms - Economic return, Foreign exchange from Mushroom cultivating countries and International trade.
Text Books: <ol style="list-style-type: none"> 1. Zadrazil F & K.Grabbe 1983 "Edible Mushroom, Biotechnology" Vol. 3, Weinheim: Verlag Chemie, Berlin. 2. Kannaiyan. 2001. Handbook of Edible Mushrooms" TNAU Publication. 3. Verma, B.N. & Prasad, Prem Kumar & Sahu, K.K. (2013) - Mushrooms : Edible and Medicinal Cultivation Conservation Strain Improvement With Their Marketing. 	
Reference Books: <ol style="list-style-type: none"> 1. Changs T.W.A. Hayanes 1978. "Biology and cultivation of Mushrooms" Academic Press N.Y. 2. Dubey, RC. (2001) A text book of Biotechnology, S.Chand & Co. Ltd. 	

Course outcomes

1. Understand the significance of Edible, Poisonous and Hallucinogenic mushrooms.
2. Know the cultivation methods of various kinds of mushrooms
3. Aware of various kinds of diseases affecting mushrooms and different preservation techniques.
4. Gain knowledge on medicinal and nutritive values of mushrooms in terms of human welfare.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	✓

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	4	3	4	4	3	4	4	3.6
CO2	3	2	3	3	3	3	2	4	2	2.7
CO3	3	3	3	4	3	4	4	2	4	3.3
CO4	4	3	4	3	4	4	4	3	3	3.5
Mean Overall Score										3.27

Result: The Score for this course is 3.27 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 2	COURSE CODE: U21BO4N2
GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR - 639005 B.Sc., ZOOLOGY - IV SEMESTER - NON CORE ELECTIVE - II (For the candidates admitted from the year 2021-22 onwards) ECONOMIC BOTANY	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To understand external structure of plants. 2. To explain the energy value of carbohydrates. 3. To explain the medicinal properties of traditional drug. 4. To acquire knowledge on classification of plant families, their characteristics and its economic Importance. 	
UNIT - I	A study of occurrence, morphology of useful parts and utilization of the followings Cereals and Millets - <i>Zea mays</i> , <i>Pennisetum typhoideas</i> , <i>Sorghum vulgare</i> and <i>Oryza Sativa</i> . Fibre Crops: Coir - <i>Cocos nucifera</i> , <i>Agave americana</i> , <i>Hibiscus canabinus</i> and <i>Corchorus</i> , <i>Capsularis</i> .
UNIT - II	Medicinal Plant: <i>Catheranthus roseus</i> , <i>Zingiber officinale</i> , <i>Dioscorea alata</i> , <i>Allium sativum</i> , <i>Eclipta alba</i> , <i>Centella asiatica</i> and <i>Withania somnifera</i> . Wood and timber plants: <i>Tectona grantiflora</i> , <i>Terminalia archuna</i> , <i>Azartirachta indica</i> , <i>Bamboosa aridinarifolia</i> and Seed general account.
UNIT - III	Tuber Crops: Tapioca, Sweet Potato and Amorphophallus. Pluses: Cajanus, Cow pea, Black gram, Green gram. Fruits and nuts - Cashew Nut, Mango, Plantain, Jack, Papaya and Orange.
UNIT - IV	Oil seed: <i>Cocos nucifera</i> , <i>Arachis hypogaea</i> , <i>Helianthus annus</i> , <i>Ricinus communis</i> and <i>Sesamum indicum</i> . Fuel wood: <i>Prosopis</i> , <i>Tamarindus</i> , <i>Eucalyptus</i> and <i>Casuarina</i> .
UNIT - V	Condiments and Spices: Chillies, Cardamom, Cinnamon, Curcuma, Onion, Coriander and Pimpenella.
Text Books: <ol style="list-style-type: none"> 1. Sambamurty, AVSS and Subrahmanyam, N.S. (2008). A Textbook of Modern Economic Botany. 1st Edition, Paperback. CBS Publishers & Distributors Pvt. Ltd., 1st edition (4 September 2008). 2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands. 	
Reference Books: <ol style="list-style-type: none"> 1. Bakhru, H.K. 1992. Herbs that Heals. Vision Books Ltd., New Delhi. 2. Vaidya Bhagwar Dash, 1978. Fundamentals of Ayurvedic Medicine, Konark, Publishers Pvt. Ltd Delhi. 3. Prajapati, N. D.S.S. Purohit & U.Kumar.2003. A Hand Book of Medicinal Plant. Agrobios Publication, India. 4. Frank, H. & M. Martin. 2006. Herbal Medicine and Botanical Medicinal fads. Viva Books Pvt Ltd., New Delhi. 5. Despandey, D.J.2008. A Handbook of Herbal Remedies. Agrobios, Jodhpur, India. 6. CSIR- Central Institute of Medicinal and Aromatic Plants, Lucknow (2016). Ayush Gyanya : Handbook of Medicinal and Aromatic Plant Cultivation. 7. Kochhar, S.L. (2016). Economic Botany: A Comprehensive Study. 5th Edition. Cambridge. 8. Samba Murty, AVSS and Subrahmanyam, N.S. (1989). A text book of Economic Botany. Wiley Eastern Ltd., New Delhi. 	

Course outcomes**On the completion of this course, the students will be able**

1. Understand core concepts of Economic Botany and relate with environment, populations, communities, and ecosystems.
2. Appreciate the diversity of plants and the plant products in human use.
3. Describe the Nutritive and antioxidant value of fruits and vegetables.
4. Increase the awareness and appreciation of plants & plant products encountered in everyday life.
5. Summarize and analyze the phytoconstituents of therapeutic values of plant drugs.

Nature of Course

Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	3	4	4	2	3	2	3.1
CO2	3	4	3	3	2	4	3	3	3	3.1
CO3	3	3	3	4	3	4	3	3	3	3.2
CO4	3	4	4	3	4	4	4	3	4	3.6
Mean Overall Score										3.25

Result: The Score for this course is 3.25 (High Relationship)**Note:**

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:**CHAIRMAN - BOS****CONTROLLER OF EXAMINATIONS**

NO. OF CREDITS: 5	COURSE CODE: U21BO5C7
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - CORE COURSE - VII (For the candidates admitted from the year 2021-22 onwards) GENETICS AND EVOLUTION	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To know the role of gene in character determination of an organism. 2. The change in the gene order, how it brings the change in the external morphology and the characters in an organism. 3. To understand the production of hybrids and the techniques in hybridization this brings the new varieties. 4. Interpret the concept of Lamarckism, Darwinism, Neo - Darwinism and Modern synthetic theories. 	
UNIT - I	Transmission Genetics: Heritage from Mendel History of Mendel's studies - Mendel's law of inheritance - Law of dominance, segregation and independent assortment - Monohybrid and Dihybrid Crosses - Back Crosses (Dominant Recessive Back Crosses) - Reciprocal Cross and Eugenics.
UNIT - II	Transmission Genetics: Mendel's experiments in modern context Allelic and Non-allelic interactions between genes - Allelic interaction (Incomplete Dominance); Non-allelic Interactions - Inheritance of comb shape in Fowls, Lethal Factor, Complementary Factor, Supplementary Factor, Epistasis, Inhibitory Factor, Duplicate Factors, Multiple Factor Hypothesis, Multiple Alleles and Blood groups.
UNIT - III	Chromosomal Basis of Heredity Structural and numerical variations of chromosomes. Mutation - Biochemical, Lethal, Somatic and Germinal mutations; Spontaneous and Induced Mutations - Mutagenic Agents; Point mutation, Chromosome mutation and Genomic mutation. Role of mutation in evolution. Polyploidy and its Types - Euploidy, Aneuploidy and Polyploidy - Autopolyploidy and Allopolyploidy.
UNIT - IV	Gene Linkage Linkage and Crossing Over - Coupling and Repulsion - Complete and Incomplete Linkage - Mechanism of Crossing Over - Cytological Proof of Crossing Over, Sex determination, differentiation and sex-linkage, Sex Linked Inheritance - <i>Drosophila</i> (Eye Colour) and Humans (Colour Blindness); Cytoplasmic Inheritance. Sex Determination in <i>Drosophila</i> , Humans and Plants.
UNIT - V	Evolution Introduction, Scope and History of evolution. Origin of life - Evolution Concepts in Diversity of Life. Lamarckism, Darwinism, Neo- Darwinism and Modern Synthetic Theories.
Text Books: <ol style="list-style-type: none"> 1. Gupta, P.K. (2000): Genetics Rastogi Publishers, Meerut, India - 611 pp., 2. Singh B.D 2005 Genetics Kalyani Publishers New Delhi. 	
Reference Books: GENETICS: <ol style="list-style-type: none"> 1. Sambamurthy A.V.S.S. 2005 Genetics Narosa Publishing House, New Delhi. 2. Sarin C 2002 Genetics. Tata McGraw-Hill Publishing Co. Ltd, New Delhi. 3. Strickberger, M.W. (1976): Genetics (2nd Edition) MacMillan Publishing Co. Inc. N.Y. London 914pp. 4. Herskowitz, L.H. (1977): Principles of Genetics (2nd Edition) MacMillan Publishing Co., Inc., N.Y. & Collier - Macmillan. 	
EVOLUTION: <ol style="list-style-type: none"> 1. Savage J.M. (1969) Evolution (2nd Edition) Amarind Publishing Cosec P (P) Ltd., New Delhi, Bombay, Calcutta. 2. Gottlieb, L.D. & Jain, S.K. (1988): Plant Evolutionary Biology Chapman & Hill, London, N.Y- 414 pp. 3. Shukla, R.S. & P.S. Chandel (1996): Cytogenetics, Evolution & Plant Breeding S.Chand & Co., New Delhi 4. Verma, P.S. & V.K. Agarwal (1999): Concepts of Evolution S. Chand & Co., New Delhi - 48pp. 5. Anna Sproule (1998): Charles Darwin Scientists who have changed the world Orient Longmans, Hyderabad - 64 pp. 	

Course outcomes

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

1. Understand the fundamental principles of genetics and to analyse traits in plants.
2. Analyze the mechanism governing Mendelian inheritance and gene interactions.
3. Acquire knowledge on mechanism that generates variation in trait.
4. Acquaint principles of genetics to real world problems in biology.
5. They know the evolutionary concept and theories.

Nature of Course			
Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	4	3	3	4	4	3	3	4	3.5
CO2	4	4	3	3	3	3	3	3	3	3.2
CO3	4	3	3	4	4	4	3	3	4	3.5
CO4	3	4	4	3	4	3	4	3	3	3.4
Mean Overall Score										3.40

Result: The Score for this course is 3.40 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSECODE: U21BO5C8
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - CORE COURSE - VIII (For the candidates admitted from the year 2021-22onwards) TAXONOMY OF ANGIOSPERMS	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To know the basic morphological features of plants and its parts. 2. To study the classification of plants based on their habitual and morphological characters. 3. To study the taxonomical description, flower characters and economic importance of plants belongs to selected families. 	
UNIT - I	MORPHOLOGY Leaf: Types, shape and Modification, phyllotaxy. Stem: Shape, types and modifications (underground, aerial and sub aerial) Root: Types and modifications. Inflorescence: Types. Flower - Descriptive terminology of floral parts. Fruit: Types.
UNIT - II	TAXONOMY Plant Nomenclature, ICBN, ICN and Binomial system. Angiosperms classification: Bentham and Hooker, Bessy and APG in brief - Merits and Demerits. Taxonomical tools - Herbarium. Taxonomy in relation to Anatomy and embryology
UNIT - III	A detailed study of the following families and their economic importance: Annonaceae, Capparidaceae, Malvaceae, Sterculiaceae, Tiliaceae, Anacardiaceae, Rutaceae, Leguminosae (Fabaceae, Caesalpinaceae and Mimosaceae) and Cucurbitaceae.
UNIT - IV	A detailed study of the following families and their economic Importance: Rubiaceae, Asteraceae, Apocyanaceae, Solanaceae, Convolvulaceae, Acanthaceae, Verbenaceae and Lamiaceae.
UNIT – V	A detailed study of the following families and their economic importance: Amaranthaceae, Euphorbiaceae, Loranthaceae, Lilliacae, Commelinaceae, Cyperaceae and Poaceae.
Text Books: <ol style="list-style-type: none"> 1. Manilal, K.S. and M.S.Muktesh Kumar (ed.) 1998. A Hand book of Taxonomy Training, DST, New Delhi. 2. Lawrence George H.M. 1951. Taxonomy of vascular plants Oxford and IBH Publ. Co. Pvt. Ltd., New Delhi. 	
Reference Books: <ol style="list-style-type: none"> 1. Davis, P.H. and V.H.Heywood 1991. Principles of Angiosperm Taxonomy. Today and Tomorrow Publications, New Delhi. 2. Conquest, A. 1981. An Integrated system of Classifications of flowering plants. Columbia University Press, New York. 3. Gurcharan Singh. 2004. Plant Systematic: Theory and practice Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi. 4. Stoeckle, M. (2003) Taxonomy, DNA and the bard code of life .bioscience 53: 796 - 797. 5. Simpson M.G. (2006). Plant systematics, Elsevier Academic Press, USA. 	

Course outcomes

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

1. Learn the types of classifications- artificial, Natural and phylogenetic.
2. Gain knowledge about Botanical Survey of India (BSI).
3. Briefly study on herbarium techniques.
4. Learn the taxonomic evidences from molecular, numerical and chemical methods.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of Cos
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	3	4	4	3	4	3	3.4
CO2	3	4	4	3	2	4	3	3	4	3.3
CO3	4	3	3	4	3	4	3	3	5	3.5
CO4	3	4	4	3	4	4	4	3	3	3.5
Mean Overall Score										3.42

Result: The Score for this course is 3.42 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 3	COURSE CODE: U21BO5C9
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - CORE COURSE - IX (For the candidates admitted from the year 2021-22onwards) PLANT ECOLOGY AND BIODIVERSITY CONSERVATION	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To understand the interactions of abiotic and biotic factors to maintain the ecosystem. 2. To acquire knowledge about the structure of community along with the ecological succession. 3. To study the effects of different types of pollution and its control measures. 4. To understand the different domains of distribution of plants in the world. 	
UNIT - I	Ecology - Definition and its Divisions - Autecology and Synecology - Plant ecology and its applications. Environmental or ecological factors - Climatic, Soil, Physiographic and Biotic factors.
UNIT - II	Ecosystem - structure and function - Producers, Consumers and Decomposers. Major Ecosystem - Forest Ecosystem, Grassland Ecosystem, Desert Ecosystem, Aquatic Ecosystem and Artificial Ecosystem. Energy and its flow in Ecosystem - Tropic level - Food chains - Food web - Ecological Pyramids - Pyramid of numbers, Pyramid of biomass and Pyramid of energy.
UNIT - III	Plant succession, Plant Adaptations - Hydrophytes, Xerophytes, Mesophytes, Epiphytes, Halophytes and Mangrove vegetation - Methods of study of vegetation (Quadrant & Transect).
UNIT - IV	Environmental Pollution - Soil Pollution, Water Pollution, Air Pollution, Agriculture Pollution, Radiation Pollution, Thermal Pollution, Noise Pollution, Control on environmental Pollution, Acid rain, Green House effect and Global Warming- Impact of Pollution on vegetation - Control of Pollution through vegetation.
UNIT - V	Principles of Phytogeography, Climate and Climatic regions of India, Phytogeographical regions of India and Ecological indicators. Biodiversity - Hot Spots of Biodiversity in India - threats to Indian Biodiversity, National Biodiversity Authorities of India, conservation of Biodiversity - <i>In situ</i> and <i>Ex situ</i> conservation, Endemic and Endangered flora.
Text Book: <ol style="list-style-type: none"> 1. Aulay Mackenzie. Andy, S.Ball and Sonia R.Virdee, 2002. Instant notes Ecology 2nd edition, Viva books, Chennai. 	
Reference Books: <ol style="list-style-type: none"> 1. Puri G.S 1960 - Indian Forest ecology (Vol I&II) Oxford Book Co., New Delhi & Calcutta. 2. Agarwal, K.C, 2001. Fundamentals of Environmental Biology, S. Chand, New Delhi. 3. Prof. Y.Anjaneyalu - Introduction of Environmental Science - BSP - BS Publication Hydrabad. 4. Odum E.P (1971) - Fundamental of Ecology - Sounders & Co. 5. Mishra, S.P. (2006), Environmental Pollution - Pointer Publishers, Jaipur. 6. Claude Fauric, Christiane Ferra, Paul Medori and Jean Devaux, 2001. Ecology science and practice special Indian edition, Oxford & IBH. 7. Dash, M.C, 2004. Fundamentals of Ecology, Tata McGraw, Hill, New Delhi. 	

Course outcomes

1. Understand the ecological relationship between organism and environment.
2. Promote the knowledge of conservation and management of natural resources.
3. Comprehend biotic and abiotic factors that influence population dynamics.
4. Provide knowledge on forest types, climatic factors, edaphic factors, local and geographical distribution of plants.
5. Acquire knowledge about structural and functional adaptations of plants to their physical environment.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	3	3	4	3	4	3	3	3	3	3.2
CO2	4	3	3	3	3	4	3	3	3	3.2
CO3	4	3	3	4	3	4	3	3	5	3.5
CO4	4	4	3	3	4	3	4	3	3	3.4
Mean Overall Score										3.32

Result: The Score for this course is 3.32 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO5E1
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - ELECTIVE COURSE - I (For the candidates admitted from the year 2021-22 onwards) BIostatistics, COMPUTER APPLICATION AND BIOINFORMATICS	
COURSE OBJECTIVES: 1. To acquire knowledge on biostatistical methods and the application of computers in Biostatistics. 2. To focus computer science techniques used in biological studies. 3. To introduce classical bioinformatics theory to students.	
UNIT - I	Biostatistics Definition of Biostatistics, Collection of data - Primary and secondary - Classification of data - Tabulation of data - Parts of Table - diagrammatic representation of data.
UNIT - II	Measures of central tendency - Mean, Median and Mode (Calculation and theory) - Standard Deviation (Calculation and theory), Standard Error (Calculation and theory) Skewness and Kurtosis, Correlation of analysis - types, methods of studying correlation (Only theory).
UNIT - III	Computer applications History of Computers, Basic Computer Concepts, Types of Computers, parts of a Computer - Input and Output Devices, Computer Memory, Storage Devices, Central Processing Unit, Software, Hardware, Computer Peripherals - Mouse, Modem.
UNIT - IV	Web Browsing: Computer Network (LAN, WAN, Wi - Fi and Li - Fi), Word Processing Software MS - office - MS Word, Excel, Power point, and Desk Top Publishing. Internet and Intranet.
UNIT - V	Bioinformatics Introduction to bioinformatics, application of bioinformatics in various fields. Biological databases - Nucleic acid databases - Gen Bank, DDBJ and EMBL. Protein data bases: SWISS PROT and PDB - Biological data formats (FASTA and BLAST).
Text Books: 1. P.K.Gupta, Statistical methods - Chand & Co, New Delhi. 2. Basic Concepts of Biostatistics - N.Arumugam, Saras Publication, ISBN: 9789384826710. 3. Computer Fundamentals : Introduction to Computer, Uses of Computer, Main Components of Computer, Input Devices, Output Devices, Hardware, Software, Operating System, and Internet By Steven Bright. 2017. ISBN: 9781549528804, 1549528807. 4. Bioinformatics - S.C.Rastogi, Namita Mendiratta and Parag Rastogi. 5. Basic Bioinformatics - By S.Ignacimuthu. 2013; Publisher: Alpha Science International.	
Reference Books: 1. Biostatistics: Concepts and Applications for Biologists By Brian Williams, ISBN 9781138557772, (1993) Published January 25, 2019 by CRC Press. 2. Sharma, K.L.A.P., Pullaiah, T. & Reddy, B.Ravindra - Biosatistics - ASTRAL International (P) Ltd, New Delhi. 3. Computer fundamentals windows and Internet- Ramaiha publication. 4. Windows and MS-OFFICE 2000 with database Concepts, by Krishnan, Scitech Publication (India) Pvt. Ltd, Chennai. 5. Bryan Bergeron, M.D. (2006). Bioinformatics Computing, Prentice - Hall of India. New Delhi. 6. Attwood T K and Parry Smith D J, (1999).Introduction to Bioinformatics Addison Wesley Longman Limited, England.	

Course outcomes

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

1. To introduce the statistical methods for analyzing a data.
2. To analyze and interpret a sample data using various methods.
3. To update the computer knowledge in presenting the data.
4. To introduce the biological databases and computer languages.
5. To understand the sequence analysis techniques.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	3	2	3	3	4	4	3	3	3	3.1
CO2	2	3	2	3	3	4	3	3	3	2.8
CO3	3	3	3	3	3	3	3	3	3	3.0
CO4	2	3	3	3	4	3	3	3	3	3.0
Mean Overall Score										2.97

Result: The Score for this course is 2.97 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO5S2
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - SKILL BASED ELECTIVE - II (For the candidates admitted from the year 2021-22 onwards) HERBAL TECHNOLOGY	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To understand about Indian system of medicine like Siddha, Ayurveda Unani and Aromatherapy. 2. To acquire knowledge about some medicinal Plants. 3. To know about drug adulteration and adulterations. 4. To gain knowledge about Herbal preparations and its uses. 	
UNIT - I	Herbal medicines: Introduction, history, scope, classification of drugs in Medicinal Plants. Cultivation of herbal plants and Importance of Herbal Gardens. Medicinal gardening. - Gardens in the hills and plains, house garden.
UNIT - II	Ethnobotany: Definition, Importance of ethnobotany, Methodologies of ethnobotanical research- field work, herbaria and museum. Indian systems of medicine - Siddha, Ayurveda, Unani and Aromatherapy.
UNIT - III	Drug adulteration and adulterant - types, methods of drug evaluation. Tribal (South India) medicines and its role in Health Care. Intellectual Property Rights (IPR), Biobiracy and Patent Rights.
UNIT - IV	Detailed organoleptic study of <i>Justicea adathoda</i> , <i>Andrographis paniculata</i> , <i>Gymnema sylvestres</i> , <i>Azadiracta indica</i> , <i>Datura metal</i> , <i>Eclipta alba</i> , <i>Embllica officinalis</i> , <i>Ocimum tenuiflorum</i> , <i>Phyllanthus niruri</i> , <i>Catheranthus roseus</i> and <i>Zingiber officinalis</i> .
UNIT - V	Herbal preparations - Collection of wild herbs, capsules and compresses. Glycerites, Hydrotherapy or Herbal oils - Liquid extracts of Tincture and Herbal teas. Extraction of phytopharmaceuticals: Alkaloids, Volatile oils, Resins and Tannins.
Text Books: <ol style="list-style-type: none"> 1. John Jothi Prakash,E. (2003). Medicinal Botany and Pharmacognosy. JPR Publication, Vallioor, Tirunelveli. 2. Joshi, S.G. (2001). Medicinal plants. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. 3. Medicinal Plants Source Book India, (1996). International Library Association, Switzerland. 4. Prajapathi, Purohit, Sharma and Kumar. (2003). A Hand book of Medicinal plants. Agrobios Publications, Jodhpur. 5. Purohit and Vyas, (2004). Medicinal Plants Cultivation. Agrobios Publications, Jodhpur. 	
Reference Books: <ol style="list-style-type: none"> 1. bJain S.K. 1989 Methods and approaches in Ethnobotany, Society of Ethnobotanists in Lucknow. 2. Bhattacharjee, S.K. 2004. Hand Book of Medicinal plants. Pointer Publishers,Jaipur. 3. Gokhale, S.B., Kokate, C.K. and Purohit, A.P. (2003). Pharmacognosy. NiraliPrakashan. 4. Pune.Pal D.C and Jain S.K 1998. Tribal medicine, Naya prakash publishers,Calcutta. 5. Jain, (2001). Medicinal plants. National Book Trust, New Delhi. 	

Course outcomes

1. Create platform to understand about Indian system of medicine such as Ayurveda, Siddha, Unani and Naturopathy.
2. Gain knowledge to prevent the Drug adulteration and its marketing.
3. Learn about common medicinal plants in India.
4. Imply the practice of Herbal preparations and their remedies to maintain health and cure diseases.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	2	4	4	4	4	3	4	4	3.6
CO2	3	3	3	3	3	4	2	2	3	2.8
CO3	4	3	2	4	3	3	3	3	3	3.1
CO4	3	3	3	3	4	4	3	4	3	3.3
Mean Overall Score										3.2

Result: The Score for this course is 3.2 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO5S3
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - V SEMESTER - SKILL BASED ELECTIVE - III (For the candidates admitted from the year 2021-22onwards) PLANT TISSUE CULTURE	
COURSE OBJECTIVES:	
<ol style="list-style-type: none"> 1. To study about the tissue culture laboratory establishment. 2. To study the media preparation, various explant sources and conservation of plants. 3. To understand the wider applications of plant tissue culture. 	
UNIT - I	Plant Tissue Culture: Introduction - Laboratory organization - Tools and Techniques - pH meter, Autoclave, Laminar Air Flow Chamber - Glassware Cleaning and Sterilization methods - Lab Safety.
UNIT - II	Culture media: Composition - Preparation of MS Medium, B5 medium and White's Medium. Moist heat sterilization - Explant sterilization. Carbon Source and Solidifying agent.
UNIT - III	Concept of Totipotency - Explants Sources - Callus Culture - Suspension Culture - Meristem Culture - Direct and Indirect Plant Regeneration.
UNIT - IV	Haploid Production - Anther Culture - Pollen Culture - Androgenic Haploids - Ovary Culture - Gynogenic Haploids - Diploidization of Haploids.
UNIT - V	Somatic Embryogenesis - Artificial Seeds - Encapsulating Agents - Application of Somatic Embryogenesis and Synthetic Seeds- Application of Plant Tissue Culture in Agriculture and Forestry.
Text Books:	
<ol style="list-style-type: none"> 1. George, E.F. and P.D.Sherrington, 1984. Plant propagation by tissue culture. Exegetic Ltd London. 2. Kalyan Kumar De. 2004. An Introduction to Plant Tissue Culture. New Central Book Agency, Calcutta. 	
Reference Books:	
<ol style="list-style-type: none"> 1. Razdan, M.K, 1993. An Introduction to Plant Tissue Culture - Oxford and IBH publishing co, New Delhi. 2. Kalyankumar 1992, Cell culture and Somatic Cell genetics of plant. 3 volumes. Academic press Inc. 3. London Timir Baran Jha and Biswajit Ghost, Plant tissue culture (Basic and Applied). University Press, Hyderabad. 2005 4. Pullaiah, T. (2013), Plant Tissue Culture: Emerging Trends - ASTRAL International (P) Ltd, New Delhi. 5. Dodds T.H and Roberts I.W, 1985. Experiments in Plant Tissue Culture. Cambridge University Press. 6. Bhojwani, S.S. & Razdan, M.K. (2004). Plant Tissue Culture, Read Elsevier India Pvt. Ltd. 7. Kalyankumar De, (2008). Plant tissue culture. New Central Book Agency, Calcutta. 8. Purohit, S.S. 2010. Plant Tissue Culture. Agrobios (India) Revised Edition. 	

Course outcomes

1. To describe about plant tissue culture.
2. To classify the different explants sources.
3. To apply the conservation techniques to the field.
4. To analyze different media composition for plant tissue culture.
5. To evaluate different types of growth hormones for betterment of the plant growth.

Nature of Course			
Knowledge and skill		Employability oriented	
Skill oriented	✓	Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	4	4	2	3	4	4	2	2	3.2
CO2	4	4	4	2	3	3	3	2	2	3.0
CO3	4	4	4	3	4	4	4	4	3	3.7
CO4	2	4	3	2	3	4	3	3	2	2.8
CO5	4	4	3	2	3	3	3	3	2	3.0
Mean Overall Score										3.14

Result: The Score for this course is 3.14 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO6C10P
<p align="center">GOVERNMENT ARTS COLLEGE (AUTONOMOUS), KARUR - 639005</p> <p align="center">B.Sc., BOTANY - VI SEMESTER - CORE COURSE - X (For the candidates admitted from the year 2021-22 onwards)</p> <p align="center">PRACTICAL - III (Covering CC - VII, CC - VIII AND CC - IX) (GENETICS, EVOLUTION, TAXONOMY OF ANGIOSPERM AND PLANT ECOLOGY AND BIODIVERSITY CONSERVATION)</p>	
<p>COURSE OBJECTIVES:</p> <ol style="list-style-type: none"> 1. To acquire the knowledge on gene and its transfer mechanisms and also know the concept of mutation and its effects. 2. Understand the origin of basic biological molecules and evolution. 3. To understand habit, habitat and morphological characters of plants. 4. To impart the knowledge on plant systematic and its applications. 5. To familiarize the identification, nomenclature and classification of plants. 	
<p>Genetics</p> <ol style="list-style-type: none"> 1. Problems on simple, monohybrid and dihybrid ratio. 2. Simple problem of interaction on various factors are included in the theory. 	
<p>Morphology</p> <p>Study of Morphological features - Leaf, Stipule, Stem and Root. Sexual features - Inflorescence, Flowers and Fruits.</p>	
<p>Taxonomy</p> <p>1. Detailed study of any 15 families</p> <p>Nymphaeaceae, Annonaceae, Capparidaceae, Malvaceae, Sterculiaceae, Tiliaceae, Anacardiaceae, Rutaceae, Leguminosae (Fabaceae, Ceasalpinaceae and Mimosaceae), Cucurbitaceae, Rubiaceae, Asteraceae, Apocyanaceae, Acanthaceae, Solanaceae, Convolvulaceae, Lamiaceae, Verbenaceae, Amaranthaceae, Euphorbiaceae, Lilliacae, Poaceae and Cypraceae. Submission of atleast 25 numbers of herbarium of plant materials as per theory syllabus.</p>	
<p>2. Field trips</p> <p>Botanical Tour (2 - 3 days) to any botanically rich location in and around Tamil Nadu / other states.</p>	
<p>Plant Ecology and Phytogeography:</p> <ol style="list-style-type: none"> 1. Study of Morphological and anatomical features of hydrophytes, xerophytes and mesophytes. 2. Study of morphological features of epiphytes, parasites and halophytes. 3. Studies of vegetation by quadrat, line transect and estimation of frequency, density and dominance cover. 4. Determination of soil and water pH. 	
<p>Course outcomes</p> <ol style="list-style-type: none"> 1. It gives knowledge on Genetic problem solving method and Taxonomical study on various families. 2. To dissect out the floral parts of plants coming under the families prescribed in the theory syllabus. 3. To identify the economic products related to theory syllabus and write Botanical name, family and uses. 4. To observe the genetic variations among inter and intra specific plants. 	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	3	3	4	4	4	2	3	3	3.3
CO2	4	3	4	4	2	4	3	3	3	3.3
CO3	4	3	3	4	3	4	3	3	4	3.4
CO4	4	3	4	3	4	4	4	3	3	3.5
Mean Overall Score										3.37

Result: The Score for this course is 3.37 (High Relationship)

Nature of Course			
Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO6C11P
<p align="center">GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005</p> <p align="center">B.Sc., BOTANY - VI SEMESTER - CORE COURSE - XI (For the candidates admitted from the year 2021-22onwards)</p> <p align="center">PRACTICAL - IV (Covering CC - XII AND CC - XIII) (MICROBIOLOGY, PLANT PHYSIOLOGY, BIO - CHEMISTRY AND BIO - PHYSICS)</p>	
<p>COURSE OBJECTIVES:</p> <ol style="list-style-type: none"> 1. It develops the practical skill of students on micro preparation study and physiological as well as ecological nature of plants. 2. It impacts the basic knowledge of Plant physiology of plants. 	
<p>Microbiology:</p> <ol style="list-style-type: none"> 1. Media Preparation - Sterilization Procedure. 2. Isolation of Microbes by serial dilution methods from Water and Soil samples. 3. Gram Staining of Bacteria. 4. Histochemical localization of VAM fungi. 	
<p>Physiology and Biochemistry Experiments:</p> <ol style="list-style-type: none"> 1. Determination of Osmotic Pressure in potato cells. 2. Effect of Light Intensity on Transpiration Using Ganong's Potometer. 3. Comparison of Stomatal and Cuticular Transpiration by Cobalt Chloride Test. 4. Measurement of Oxygen Evolution under Different Colored Light Using Wilmott's Bubbler. 5. Determination of Photosynthetic Rate under Different CO₂ Concentration. 6. Measurement of Respiration Rate using Germinating Seeds and Flower Buds with Simple Respiroscope. 7. Separation of Plant Pigments by Paper chromatography. 8. Estimation of total chlorophyll contents in leaves. 9. Extraction and Estimation of total Sugar. 10. Estimation of lipids. 	
<p>Demonstration:</p> <ol style="list-style-type: none"> 1. Osmosis. 2. Ganong's Light Screen. 3. Anaerobic Respiration. 4. Fermentation. 5. Lever Auxanometer. 6. Clinostat. 	
<p>Bioinstruments Demonstration</p> <ol style="list-style-type: none"> 1. pH Meter. 2. Centrifuge. 3. Spectrophotometer. 4. Electrophoretic Apparatus. 	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	3	3	4	3	4	4	2	3	3	3.2
CO2	4	3	3	3	3	4	3	3	3	3.2
CO3	4	3	3	4	3	4	3	3	5	3.5
CO4	4	3	3	3	4	4	4	3	3	3.4
Mean Overall Score										3.32

Result: The Score for this course is 3.32(High Relationship)

Nature of Course			
Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value Mean Score of COs = ----- Total No. of Pos & PSOs	Total of Mean Score Mean overall score for COs = ----- Total No. of COS
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COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO6C12
GOVERNMENT ARTS COLLEGE (AUTONOU MOUS), KARUR - 639005 B.Sc., BOTANY - VI SEMESTER - CORE COURSE - XII (For the candidates admitted from the year 2021-22 onwards) GENERAL MICROBIOLOGY	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To trace the historical developments, scope of microbiology and classification of microbes. 2. To study the major features of Bacteria and its importance. 3. To understand the characteristics of Viruses. 4. To gain the knowledge about art of growing microorganisms in laboratory conditions. 5. To deal with soil microbes and its importance and useful functions. 	
UNIT - I	Introduction, History, development and scope of microbiology. Distinguishing features in different types of Bacteria. Microbial taxonomy and its modern trends (Wittaker's and Bergey's) Staining methods - Simple, negative, differential, acid fast and Gram's staining.
UNIT - II	Bacteria - Morphology - size, shape, structure, ultra structure: cell wall, capsule, flagella, pili, endospore, plasmid, locomotion. Reproduction - binary fission, genetic recombination - conjugation, transformation and transduction. Economic importance of bacteria.
UNIT - III	Viruses - Introduction, Classification, characteristic feature, structure, types, isolation and cultivation of viruses. Plant viruses. Replication of viruses - lytic and lysogenic cycles. Economic importance of viruses.
UNIT - IV	Culture of Microorganisms - Types of culture media, methods of sterilization - disinfectant, antiseptic, sanitizer, germicide, moist heat and dry heat (incineration, hot air oven), fractional sterilization, Pasteurization, Tantalization, filtration. Methods of growing and maintenance of culture. Isolation and pure culture techniques of bacteria and fungi.
UNIT - V	Agricultural and Environmental microbiology - soil microbes. Nitrogen fixers, phosphate solubilizers, mycorrhizae (Ecto, Endo and Ectendo) Conversion of waste into organic compost, vermicompost - process of vermicomposting, Sewage treatment - sewage microbes, BOD, COD, small and large scale sewage treatment - Primary and Secondary and Tertiary treatments.
Text Books: <ol style="list-style-type: none"> 1. Dubey, R.C. and D.K. Maheswari, 2007. A Textbook of Microbiology, S.Chand & Company, New Delhi. 2. Pelczar M.J, Chan, E.C.S, (1986) Microbiology, Tata McGraw Hil Publishing Co., Ltd, New Delhi - 918p. 	
Reference Books: <ol style="list-style-type: none"> 1. Sharma, P.D. (1993), Microbiology, Rastogi Publications, Merut, India - 359p. 2. Agrawal, A.K, parihar ,P. (2006) Industrial microbiology , Student Edition , Jodhpur 3. Dubey. R.C. & Maheswari, D.K. (1999): A Text Bok of Microbiology, S. Chand & Co., New Delhi-682. 4. Prescott, Harley and Klein' S. (2008) Microbiology 7th edition, McGraw hill InternationalEdition, New York. 5. Ananthanarayanan, R. and C K J. Paniker, 2004. Textbook of Microbiology. Orient Longman Pvt. Ltd. 6. Arora, D.R., 2004. Text book of Microbiology, C B S. 7. Michael, J.Pelczar, J R. E.C. Channoel, R.Krieg, 2005. Microbiology, Mc. Graw - Hill. 8. Powar, C.B and Daginawala 1991.General Microbiology Vol - I and Vol - II Himalaya publishing house, Bombay. 9. Sullia, S.B and S.Shantharam, 2005. General Microbiology, Oxford & IBH. 	

Course outcomes

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

1. Learn about classification, characteristics, ultra structure of Prokaryotic and Eukaryotic microbes.
2. Know about organisms and causal factor responsible for plant diseases & methods of studying Plant diseases.
3. Familiarize with some common plant diseases of India Gain knowledge on Host parasite interaction process.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	✓

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	2	3	2	3	3	4	4	3	4	3.11
CO2	3	4	3	4	3	3	2	3	4	3.22
CO3	3	3	3	4	3	3	3	3	4	3.22
CO4	4	3	3	4	3	2	3	3	4	3.22
Mean Overall Score										3.19

Result: The Score for this course is 3.19 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO6C13
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - VI SEMESTER - CORE COURSE - XIII (For the candidates admitted from the year 2021-22 onwards) BIOPHYSICS, BIOCHEMISTRY AND PLANT PHYSIOLOGY	
COURSE OBJECTIVES: 1. To know about the requirement of mineral nutrition for plant growth. 2. To understand the process of Photosynthesis, Respiration and Nitrogen metabolism Learn about Sensory photobiology.	
UNIT - I	Biophysics : Laws of thermodynamics, Redox potential, Entropy, Enthalpy. ATP in bioenergetics chemical bonds - Biological effect of ionizing radiation.
UNIT - II	Biochemistry : Classification, Structure and Function of Carbohydrates - Mono, Di, Oligo and Polysaccharide. Lipids - Saturated, Unsaturated and Saponification. Protein - Primary, Secondary and Tertiary Structures. Enzymes and Vitamins.
UNIT - III	Physiology: Water Relations: Physical and Chemical Properties of water, Absorption of water. SPAC - Transpiration - types, mechanism of transpiration - Guttation - Factors affecting transpiration. Translocation of Solutes. Mineral nutrition and mineral uptake - Role of Macro and Micro elements.
UNIT - IV	Role of light and Pigments in Photosynthesis - Enhancement Effect; Photo system I & II, Photophosphorylation, Light Reaction. Carbon Assimilation - Calvin Cycle, Hatch & Slack Pathway, CAM Pathway - Photorespiration. Factors affecting photosynthesis. Respiration: Respiratory Substrates. Aerobic and Anaerobic. Glycolysis, Kreb's Cycle and Oxidative Phosphorylation, Energetics of Respiration, Pentose Phosphate Pathway. Factors affecting Respiration.
UNIT - V	Plant Growth - Growth curve - Factors affecting growth. Plant Growth Regulators - Auxins, Gibberellins, Cytokinins, Ethylene and their Functions. Flowering - Role of hormones in Flowering, Photoperiodism, Vernalization. Senescence and Abscission, Phytochrome. Dormancy and Seed germination - Causes and breaking of seed and bud dormancy - Advantages of dormancy.
Text Books: 1. Panda, S. K, 2005. Advances in Strees Physiology of plants, scientific publishers India, Jodhpur. 2. Rajeshwari, M. R. (2012) - Biophysics, Rastogi Publications, Meerut.	
Reference Books: 1. Lincoln Taiz and Eduardo Zeiger, 2005. Plant Physiology Sinauver Associates Inc. Publishers, Sunderland, Massachusetts. 2. Salisbury, F. B and Cleon Ross, 2007. Plant physiology, Wadsworth publishing company, Belimont. 3. William G. Hopkins, 1999. Introduction to Plany Physiology, John Wiley and sons, INC, New York. 4. Jain, J. L., Sunjay Jain and Nitin Jain, 2007. Fundamentals of Biochemistry, S. Chand & co New Delhi. 5. Hans - Walter. Headt, 1997. Plant Biochemistry and Molecular Biology. Oxford University press, New York.	

Course outcomes

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

1. Know about the requirement of mineral nutrition for plant growth.
2. Understand the process of Photosynthesis, Respiration and Nitrogen metabolism Learn about Sensory photobiology.
3. Know about the Plant Growth hormones (Auxins, Gibberellins. Cytokinins, Ethylene) Understand the biosynthesis of terpenes, phenols and nitrogenous compounds.

Nature of Course

Knowledge and skill		Employability oriented	
Skill oriented		Entrepreneurship oriented	

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	
CO1	4	2	3	3	4	3	2	3	4	2.8
CO2	3	3	3	3	4	3	2	4	3	3.1
CO3	3	2	4	4	3	4	3	3	4	3.3
CO4	4	4	4	3	4	4	4	4	5	4.0
Mean Overall Score										3.30

Result: The Score for this course is 3.30 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = ----- Total No. of Pos & PSOs	Mean overall score for COs = ----- Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 5	COURSE CODE: U21BO6E2
<p align="center">GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005</p> <p align="center">B.Sc., BOTANY - VI SEMESTER - ELECTIVE COURSE - II (For the candidates admitted from the year 2021-22onwards)</p> <p align="center">BIOFERTILIZERS AND BIOPESTICIDES</p>	
<p>COURSE OBJECTIVES:</p> <ol style="list-style-type: none"> 1. To study beneficial bacteria and fungi. 2. Know about organic fertilizers. 3. Outlines the disease control of plants. 	
UNIT - I	Biofertilizers - Definition, kinds, microbes as biofertilizers, Symbiotic association - <i>Rhizobium</i> inoculants - Classification, Physiology, Host - <i>Rhizobium</i> interactions and mass cultivation.
UNIT - II	Organic farming methods and its uses Carrier materials, general outline of microbes as fertilizers, Rhizosphere effect - microbial products influencing the plant growth.
UNIT - III	Mycorrhizae - VAM association, occurrence, types, Collection, isolation, inoculums production and mass cultivation.
UNIT - IV	Frankia, Actinorhizae and Host plants, characteristics, identification, culture method and maintenance of <i>Anabaena</i> , <i>Azospirillum</i> , <i>Azotobacter</i> and <i>Azolla</i> .
UNIT - V	Biopesticides - Definition, Bacterial, Viral and Fungal Pesticides. Biological control of weeds - Mycoherbicides - insect used as bio control agents - Biological control of plant pathogens.
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Dubey.R.C. and Maheshwari D.K A text Book of Microbiology S.Chand and Company, New Delhi. 2. . Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi. 	
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi. 2. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay Publication, New Delhi. 3. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers. 4. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi. 5. Vayas, S.C, Vayas, S. and Modi, H.A. 1998 Bio - fertilizers and organic Farming Akta Prakashan, Nadiad. 	

Course outcomes

1. To know the knowledge about Biofertilizers and pesticides.
2. To study the mass production of Biofertilizers and its application in Agriculture.
3. To understand the knowledge about effect of Biofertilizer in Environment.
4. To understand the disease control and management.

Nature of Course

Knowledge and skill		Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	✓

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO1	PO2	PO1	PO2	PO1	PO2	PO1	
CO1	4	3	4	3	4	4	4	3	4	3.6
CO2	3	3	3	4	4	4	4	3	4	3.5
CO3	4	4	3	4	4	3	3	3	3	3.4
CO4	4	4	3	3	4	3	3	2	4	3.3
Mean Overall Score										3.45

Result: The Score for this course is 3.45 (High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = $\frac{\text{-----}}{\text{Total No. of Pos \& PSOs}}$	Mean overall score for COs = $\frac{\text{-----}}{\text{Total No. of COS}}$

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS

NO. OF CREDITS: 4	COURSE CODE: U21BO6E3
GOVERNMENT ARTS COLLEGE (AUTONOUOUS), KARUR - 639005 B.Sc., BOTANY - VI SEMESTER - ELECTIVE COURSE - III (For the candidates admitted from the year 2021-22 onwards) PLANT BIOTECHNOLOGY	
COURSE OBJECTIVES: <ol style="list-style-type: none"> 1. To acquire the knowledge on plant tissue culture. 2. To learn the basic techniques in Plant Biotechnology. 3. To study the role of Biotechnology in food, agriculture and pharmaceutical industries. 	
UNIT - I	Biotechnology - Definition, Scope, Importance and interdisciplinary areas of Biotechnology - Introduction to plant tissue culture - Concept of totipotency and pluripotency - sterilization techniques - solid & liquid medium (MS medium, Whites medium) - callus and cell suspension culture.
UNIT - II	Micropropagation - stages of micropropagation - applications - meristem culture - somatic embryogenesis - principle and applications of somaclonal variation & cryopreservation.
UNIT - III	Haploid production - anther culture - pollen culture - embryo culture and rescue - protoplast isolation, fusion and culture - somatic hybridization - cybrids - synthetic seeds.
UNIT - IV	Plasmids - General account, Plasmid as a vector - pBR 322, Ti and Ri plasmids. Cosmids and phagemids. Gene Transfer in Plants: <i>Agrobacterium</i> mediated transformation, Direct DNA Transformation - Biolistics, Lipofection, Electroporation, Microinjection and Protoplast Transformation. Gene Cloning - PCR technique - Blotting techniques - Southern, Northern and Western blotting.
UNIT - V	Production of transgenic plants - disease resistant (Bt cotton) - herbicide resistant (round up soya) - golden rice - Flavr savr tomato - Transgenic plants as bioreactors - Edible vaccines - Plant bodies - Intellectual Property Rights (IPR) - Patenting.
Text Books: <ol style="list-style-type: none"> 1. Chawla H.S., 2000. Introduction to Plant Biotechnology, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi. 2. Ramawat, K.G., 2001. Plant Biotechnology, S.Chand & Company Ltd, New Delhi. 3. Satyanarayana, U., 2005. Biotechnology. Books and Allied (P) Ltd., Kolkata. 4. Kumaresan, V. 2001 - Biotechnology, Saras Publications, Nagercoil. 5. Ignacimuthu, S.J. (2003). Plant Biotechnology. Oxford & IBH Publishing, New Delhi. 6. Gupta, P.K. 2005 Elements of Biotechnology. Rastogi Publications Meerut. 	
Reference Books: <ol style="list-style-type: none"> 1. Street H. E., 1977. Plant tissue culture, Blackwell Scientific Publications, London. 2. Trigiano R.N. and Gray D.J., 1996. Plant tissue culture - concepts and laboratory exercises. CRC Press, New York. 3. John Jothi Prakash, E. (2005). Outlines of Plant Biotechnology. Emkay Publishers, New Delhi. 4. Dubey, R.C., (2001). A text book of biotechnology. S. Chand & Co., New Delhi. 5. Trivedi, P.C. 2000. Plant Biotechnology, Panima Publishing Corporation, New Delhi. 6. Lewin, B. 2003. Genes VI, Allied Publishers, Chennai. 7. Singh B.D. 2003 Biotechnology Expanding Horizons. Kalyani publishers Ludhiana. 	

Course outcomes

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

1. To list down the sterilization techniques.
2. To understand the concept of tot potency, micro propagation and haploid production.
3. To analyze the gene transfer methods.
4. To know the technicalities in producing transgenic plants.

Nature of Course

Knowledge and skill	✓	Employability oriented	✓
Skill oriented	✓	Entrepreneurship oriented	✓ F

Mapping Course Outcome with PO and PSO

Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)				Mean Scores of COs
	PO1	PO2	PO1	PO2	PO1	PO2	PO1	PO2	PO1	
CO1	4	3	2	3	4	4	3	3	4	3.3
CO2	3	3	3	4	4	4	4	3	4	3.5
CO3	4	4	3	4	4	3	3	3	3	3.4
CO4	4	2	3	3	3	3	3	2	4	3.0
Mean Overall Score										3.3

Result: The Score for this course is 3.3(High Relationship)

Note:

Mapping	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
Scale	1	2	3	4	5
Relation	0.0 - 1.0	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 5.0
Quality	Very Poor	Poor	Moderate	High	Very High

Value Scaling:

Total of Value	Total of Mean Score
Mean Score of COs = -----	Mean overall score for COs = -----
Total No. of Pos & PSOs	Total No. of COS

COURSE DESIGNER:

CHAIRMAN - BOS

CONTROLLER OF EXAMINATIONS