

Anjuman Islam Janjira Degree College of Science

Lokmanya Tilak Road, Murud-Janjira dist. Raigarh. Maharashtra 402401

Academic Calendar

Teaching Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany)	Paper: IV
Course Code	USBO604	
Title	CURRENT TRENDS IN PLANT SCIENCES II	
Credits	2.5 Credits (60 Lectures)	
Name of the Faculty	Dr. Amanulla Khan Nasrulla	

Month	Date	Topic	Lectures	Lecture per Month
	UNIT I: Plant Biotechnology II			
Nov-25	18-11-25	DNA sequence analysis– Maxam – Gilbert Method	15	8
	19-11-25	Sanger’s method, Pyro Sequencing.		
	20-11-25	Polymerase Chain Reaction (PCR). Intro		
	27-11-25	Polymerase Chain Reaction (PCR). Ex.		
	30-11-25	DNA barcoding: Basic features		
Dec-25	01-12-25	Basic features		16
	03-12-25	nuclear genome intro		
	04-12-25	nuclear genome sequence,		
	05-12-25	chloroplast genome		
	08-12-25	chloroplast genome sequence		
	09-12-25	rbcL gene intro		
	10-12-25	rbcL gene sequence		
	11-12-25	mat K gene sequence		
	15-12-25	present status of barcoding in plants01.		
	18-12-25	present status of barcoding in plants01.		
	Unit II: Bioinformatics (Shifted from Paper – III)			
	19-12-25	Introducation		
	17-12-25	Organization of biological data, databases		
	18-12-25	Exploration of data bases,		
	19-12-25	Exploration of data bases,		
	22-12-25	Retrieval of desired data, BLAST intro		
24-12-25	Retrieval of desired data, BLAST intro			
Jan-26	01-01-26	BLAST concept and example	15	16
	02-01-26	Protein structure		
	09-01-26	Protein structure analysis		
	12-01-26	Protein structure application		
	14-01-26	Multiple sequence intro		
	15-01-26	Multiple sequence analysis		
	16-01-26	phylogenetic intro		
	21-01-26	phylogenetic analysis 1		
	22-01-26	phylogenetic analysis 2		
	Unit III: Economic Botany			
	23-01-26	Essential Oils Extraction,		
	26-01-26	perfumes, perfume oils, oil of Rose, Sandalwood,		
	28-01-26	Patchouli, Champaca, grass oils: Citronella, Vetiver.		

Feb-26	29-01-26	Fatty oils: Drying oil Linseed and Soyabean oil	15	15
	30-01-26	and Soyabean oil		
	02-02-26	semi-drying oils Cotton seed, non-drying oils (Olive oil and Peanut oil),		
	04-02-26	Vegetable Fats: Coconut oil, Palm oil		
	Unit IV : Post Harvest Technology			
	05-02-26	Storage of Plant Produce	16	
	06-02-26	–Preservation of Fruits and Vegetables		
	09-02-26	Drying (Dehydration) – Natural conditions – Sun drying,		
	11-02-26	Artificial Drying – Hot Air Drying, Vacuum Drying,		
	12-02-26	Osmotically Dried Fruits,		
	13-02-26	Crystallized or Candied Fruits,		
	16-02-26	Fruit Leather, Freeze Drying)		
	18-02-26	Freezing (Cold Air Blast System,)		
	19-02-26	Liquid Immersion method, Plate Freezers,		
	20-02-26	Cryogenic Freezing, Dehydro-Freezing, Freeze Drying		
23-02-26	Canning Pickling (in Brine, in Vinegar, Indian Pickles)			
25-02-26	Sugar Concentrates (Jams,)			
26-02-26	Jellies,			
27-02-26	Fruit juices			
Mar-26	05-03-26	Food Preservatives	6	5
	06-03-26	Use of Antioxidants in Preservation		
	07-03-26	Revision		
	08-03-26	Revision		
	12-03-26	Revision		
	13-03-26	Revision		
		Exam		
		Tot. Lec.	60	60

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Course	T.Y.B.Sc. (Botany)		Paper: IV
Course Code	USBOP604		
Title	CURRENT TRENDS IN PLANT SCIENCES II		
Credits	3		
Name of the Faculty	Dr. Amanulla Khan Nasrulla		

Month	Day	Topic	Batch	Lecture per Month
Dec-25			A	12
	Monday	DNA sequencing by Sanger's Method and Pyro Sequencing Method		
	Monday	DNA barcoding of plant material by using suitable data		
	Monday	BLAST: nBLAST, pBLAST		
Jan-26	Monday	Multiple sequence alignment	A	20
	Monday	Phylogenetic analysis		
	Monday	RASMOL/SPDBV		
	Monday	Demonstration: Extraction of essential oil using Clevenger		

	Monday	Thin layer chromatography of essential oil of Patchouli and Citronella		
Feb-26	Monday	Saponification value of Palm oil	A	16
	Monday	Preparation of Squash		
	Monday	Preparation of Jam		
	Monday	Preparation of Jelly		
Mar-26	Monday	Preparation of Pickle	A	12
		Revisions		
		Journal Cheking		
		Journal Certification		
		Tot. Lec.		60

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Teaching Plan for Semester-IV Year: 2025-2026 (NEP 2020)

Course	S.Y.B.Sc. (Botany)		Vertical – 1	Course: II
Course Code	Major (Scheme III)			
Title	Functional Botany II			
Credits	2 Credits (30 lectures)			
Name of the Faculty	Dr. Amanulla Khan Nasrulla Khan			
Month	Date	Topic	Lectures	Lecture per Month
		Module 1: Plant Anatomy	15	
Nov-25	06-11-25	Introducation of syllabus		
	06-11-25	Meristem: Characteristics, types, and functions		
	13-11-25	Plant Tissues: Parenchyma, Collenchyma,		
	13-11-25	Sclerenchyma, and Conducting tissues		
	27-11-25	Normal Secondary Growth: Dicot root		
	27-11-25	Normal Secondary Growth: Dicot stem		
Dec-25	04-12-25	Special Anatomical Features: Growth rings, Periderm,		
	04-12-25	Tylosis, Heartwood, and Sapwood		
	11-12-25	Mechanical Tissues: I-girder in plants – Inflexibility,		
	11-12-25	Incompressibility, Inextensibility		
Jan-26	01-01-26	Applied Anatomy: Anatomy in relation to taxonomy		
	01-01-26	Activity: Poster / Oral Presentation / Model of Anatomical Structures (as per theory)		
		Module 2: Plant Physiology and Plant Biochemistry		
		Plant Physiology		
	08-01-26	Phytochrome: Physico-chemical properties,		
	08-01-26	Pr–Pfr interconversion		
	15-01-26	Photoperiodism: Definition,		
	15-01-26	types (SDP, LDP, DNP),		
	22-01-26	SDP		
	22-01-26	LDP		
	29-01-26	DNP		
Feb-26	29-01-26	and significance		
	05-02-26	Vernalization: Concept,		
	05-02-26	mechanism, and applications		
	12-02-26	Plant Biochemistry		
	12-02-26	Carbohydrates: Definition,		
	19-02-26	classification,		
	19-02-26	and structure		
	26-02-26	Proteins: Definition		
	26-02-26	and classification		

Mar-26		Activity:		
	05-03-26	Documentation of flowering in local plants during different seasons		
	12-03-26	Survey and collection of dietary pulses		
	19-03-26	Revision		
	26-03-26	Revision		
		Tot. Lec.		30

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Teaching Plan for Semester-IV Year: 2025-2026 (NEP 2020)

Course	S.Y.B.Sc. (Botany)		Vertical – 1	Course: III
Course Code	Major (Scheme III)			
Title	Practical Approaches in Plant Sciences II (Practical)			
Credits	2 Credits (60 lectures) 30+30			
Name of the Faculty	Dr. Amanulla Khan Nasrulla Khan			
Month	Date	Topic	Lectures	Lecture per Month
			15	
Nov-25		Practicals - External		8
	Tuesday	Estimation of Protein by Lowry's method.		
	Tuesday	Separation of photosynthetic pigments by Paper Chromatography.		
	Tuesday	Study of Normal Secondary Growth in dicot stem and root		
	Tuesday	Coefficient of correlation.		
		Regression analysis.		
Dec-25	Tuesday	Regression analysis.		6
		Practicals - Internal		
	Tuesday	Estimation of reducing sugars.		
	Tuesday	Growth Rings, Periderm, Lenticels, Tyloses,		
Jan-26	Tuesday	Heart Wood and Sap wood.		8
	Tuesday	Study of tissues in plants (Nerium leaf, etc.).		
	Tuesday	Study of tissues in plants (Nerium leaf, etc.).	15	
	Tuesday	revision		
Feb-26	Tuesday	Journal		8
	Tuesday	revision		
	Tuesday	Journal		
	Tuesday	Certification		
Mar-26	Tuesday	Journal		
	Tuesday	revision		
	Tuesday	Journal		
	Tuesday	Certification		
Apr-26				

		Tot. Lec.	30

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Teaching Plan for Semester-II Year: 2025-2026 (NEP 2020)

Course	F.Y.B.Sc. (Botany)		Vertical – 4	Course: SEC
Course Code	Major (Scheme III)			
Title	Field Survey (Practical)			
Credits	2 Credits (30 lectures)			
Name of the Faculty	Dr. Amanulla Khan Nasrulla Khan			
Month	Date	Topic	Lectures	Lecture per Month
Nov-25	Saturday	Vegetation study by field visit for habit and habitat study	4	
	Saturday	Study of quadrat Method (List quadrat and Chart quadrat)	4	
Dec-25	Saturday	Line and Belt Transect Studies (demonstration)	4	
	Saturday	Data collection using questionnaires	4	
	Saturday	Photography technique (Geo tag photographs) and Use of GPS for Field Survey and Plant location	4	
		Revision		
Jan-26				
	Saturday	Keys for Identification of trees	4	
	Saturday	Measurement of Diameter of trees in field	4	
	Saturday	Measurement of height of trees in field	4	
Feb-26	Saturday	Volume measurement of trees	4	
	Saturday	Soil profiling using pH meter and thermometer	4	
	Saturday	Study of Biodiversity by Simpson’s Diversity Index	4	
Mar-26	Saturday	Activity: filed activity	4	
	Saturday	Analysis of BOD of water sample	4	
	Saturday	Collection and Fixing of Plankton Samplings	4	
Apr-26	Saturday	Analysis of COD of water sample	4	
		Tot. Lec.	60	0

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Teaching Plan for Semester-II Year: 2025-2026

Course	F.Y.B.Sc. (Botany)	Paper: I
Course Code	Course I (Mandatory)	
Title	Cytogenetics, Ecology and Environment Conservatio	
Credits	2. Credits (30 Lectures)	
Name of the Faculty	Dr. Firoj Yasin Shaikh	

Month	Date	Topic	Lectures	Lecture per Month
		Module 1: Cytogenetics		
	25/11/2025	Ultrastructure of cell wall	15	
	26/11/2025	fuction of cell wall		
	12-02-25	Plasma membrane		
	12-03-25	Ultrastructure and functions of the cell organelles – Chloroplast,		
	12-09-25	Endoplasmic reticulum, , Mitochondrion		
	12-10-25	Cell cycle, Mitosis in Plant Cells		
	16/12/2025	significance		
	17/12/2025	History, Concept and Definition, Genetic Terminologies		
	01-06-26	Mendelian Genetics		
	01-07-26	Law of Dominance, Law of Segregation		
	13/1/2026	Law of Independent Assortment,		
	14/1/2026	Monohybrid Cross, Dihybrid Cross, Incomplete Dominance		

	20/1/2026	Multiple alleles		
	21/1/2026	Multiple genes		
	27/1/2026	Multiple genes		
	02-03-26	Gene Interaction – Introduction and definition		
	02-04-26	Concept of epistatic		
	02-10-26	non-epistatic interactions		
	17/2/2026	Module 2: Ecology and Environment conservation 15 Lectures		
	18/2/2026	Introduction to Ecology: Concept, need and Scope		
	24/2/2026	Ecosystem - Types of ecosystems (Terrestrial & Aquatic)		
	25/2/2026	functions of ecosystem		
	03-03-26	Environmental problems and its Impact		
	03-04-26	Natural & artificial ecological imbalance		
	03-10-26	climate change (ozone depletion, greenhouse effect)		
	03-11-26	Environment Health and its management		
	17/3/2026	Waste disposal,Conservation Introduction,Conservation Introduction		
	18/3/2026	Water sanitation and recycling,In-situ conservation,Ex-situ conservation		

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Practical Plan for Semester-I Year: 2025-2026			
Course	f.Y.B.Sc. (Botany)		Paper: I
Course Code	Course I (Mandatory) Practical		
Title	Plant Science and Human Welfare.		
Credits	2		
Name of the Faculty	Dr. Firoj Yasin Shaikh		

Month	Date	Practicals	Batch	Lecture per Month
Nov-25	17/11/2025,19/11/2025	Study of vegetative and reproductive structures of Adiantum.	A & A	
	24/11/2025,26/11/2025,	Study of vegetative and reproductive structures of Cycas		
	1/12/2025,3/12/2025	Morphology of Non-essential whorls-Calyx and Corolla.		
	8/12/2025,10/11/2025	Morphology of Essential whorls. Androecium and Gynoecium		
Dec.2025	15/12/2025,17/12/2025	Study of various stages of mitosis in root tip cells (Allium).	A & A	
	22/12/2025,24/12/2025	To perform karyotyping on root tip cells of Allium cepa to observe and analyse chromosome morphology		
	5/1/2026,7/1/2026	Calculation of mean, median and mode, standard deviation		
	12/1/2026,14/1/2026	Graphical representation of data: Frequency polygon, Histogram, Ogive, Bar diagram, Pie-charts. (Using Excel Sheet)		
	19/1/2026,21/1/2026	Morphological Adaptations of plants. (Mesophytes, Xerophytes). (Identification)		
Jan-feb2025	26/1/2026,28/1/2026	Morphological Adaptations of plants	A & A	
		Field Visit: Exploration of In-Situ / Ex-Situ Conservation Methods in Botany (Visit)		
	2/2/2026,4/2/2026	Collection of seed of wild plants from natural habitat and preparation of Seed bank		
	9/2/2026,11/2/2026	(Ex-situ) and Seed ball		
	16/2/2026,18/2/2026	Repetition		

			Tot. Lec.	0

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Teaching Plan for Semester-IV Year: 2025-2026

Course	S.Y.B.Sc. (Botany)		Paper: I
Course Code	S.Y.B.Sc. (Botany) Practical (Minor)		
Title	Practical in Plant Sciences I		
Credits	2 Credits (60 Hr.)		
Name of the Faculty	Dr. Firoj Yasin Shaikh		

Month	Date	Practicals	Lectures	Lecture per Month
		Unit I: Practical in Plant Sciences I		
Nov.-25	11-07-25	Types of Inflorescences (any one example of each type).	4	
	14/11/2025	Study of Families: Malvaceae, Amaryllidaceae - Classification, Morphological peculiarities, Floral Formula, and Economic importance	4	
	21/11/2025	Study of temperature Coefficient Q10 using Phenol red indicator	4	
	28/11/2025	Separation of Carotenoids by Paper Chromatography	4	
	12-05-25	Estimation of RNA from plant material.	4	
Dec.-25	12-12-25	Study of conducting tissues in Gymnosperms and Angiosperms through Maceration technique.	4	
	19/12/2025	Study and application of Coefficient of correlation	4	
	01-02-26	Study and application of Regression analysis.	4	
	01-09-26	List of Practicals (Internal)	4	
	16/1/2026	Study of Leaf morphology	4	
Jan.2026	23/1/2026	Garden Locations	4	
	30/1/2026	Designing of Garden: Formal and Informal Gardens.	4	
	02-06-26	Study of Normal Secondary Growth in dicot stem and root.	4	
Feb-26	13/2/2026	Study of anthocyanin as pH indicator.	4	
		Tot. Practical		0

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Course	T.Y.B.Sc. (Botany)		Paper: III
Course Code	UBS501		
Title	Plant Diversity III		
Credits	4 Credits (60 Lectures)		
Name of the Faculty	Dr.Firoj Yasin Shaikh		

Month	Day	Topic	Lectures	Lecture per Month
		UNIT I: Unit I: Bryophyta		
	18/11/2025	#REF!	1	
	18/11/2025	#REF!	1	
	19/11/2025	#REF!	1	
	20/11/2025	#REF!	1	
	25/11/2025	#REF!	1	
	25/11/2025	#REF!	1	
	12-02-25	#REF!	1	
	12-02-25	#REF!	1	
	12-03-25	#REF!	1	
	12-04-25	#REF!	1	
	12-09-25	Reproduction Sexual	1	
	12-09-25	Sphagnum-Clasification, habit,character	1	
	12-10-25	Reproduction	1	
	12-11-25	Alternation of generation <i>Pelia</i>	1	
		Unit -II Pteridophyta Intro.		
	16/12/2025	General character	1	

	16/12/2025	Internal Structure <i>Lycopodium</i>	1	15
	17/12/2025	Reproduction <i>Lycopodium</i>	1	
	18/12/2025	Clasification <i>Lycopodium</i>	1	
	23/12/2025	Alternation of Generation	1	
	23/12/2025	General character <i>Equisetum</i>	1	
	01-06-26	Internal Structure <i>Equisetum</i>	1	
	01-06-25	Reproduction <i>Equisetum</i>	1	
	01-07-26	Clasification <i>Equisetum</i>	1	
	01-08-26	Alternation of Generation	1	
	13/1/2026	General character <i>Adiantum, Marselia</i>	1	
	13/1/2026	Internal Structure <i>Adiantum, Marselia</i>	1	
	14/1/2026	Reproduction <i>Adiantum, Marselia</i>	1	
	15/1/2026	Clasification <i>Adiantum, Marselia</i>	1	
Aug-25	20/1/2026	Alternation of Generation	1	15
	Unit III-Bryophytes and pteridophytes applied aspect intro.			
	20/1/2026	Ecology of bryophyte	1	
	21/1/2026	Ecology of bryophyte	2	
	22/1/2026	Economic importance of bryophyte	1	
	27/1/2026	Economic importance of bryophyte	2	
	27/1/2026	Bryophytes as Indicator	1	
	28/1/2026	Evolution of bryophyte	1	
	02-03-26	Evolution of gametophyte in bryophyte	1	
	02-03-26	Economical importance of pteridophyte	1	
	02-04-26	Diversity of pteridophyte	1	
	02-05-26	Distribution of indian pteridophyte	2	
	02-10-26	Types of sori	1	
	02-10-26	Evolution of sori in pteridophyte	1	
Sep.-2025		Unit IV Gymnosperm Intro,		15
	02-11-26	Systematic Position <i>Thuja</i>	1	
	02-12-26	External Feature	1	
	17/2/2026	Internal structure	1	
	17/2/2026	Reproduction	1	
	18/2/2026	Alternation of generation of <i>Thuja</i>	1	
	19/2/2026	Systematic Position <i>Gnetum</i>	1	0
	24/2/2026	External Feature	1	
	24/2/2026	Internal structure	1	
	25/2/2026	Reproduction	1	
	26/2/2026	Alternation of generation of <i>Gnetum</i>	1	
	03-10-26	Systematic Position <i>Ephedra</i>	1	
	03-10-26	External Feature	1	
	03-11-26	Internal structure	1	
	03-12-26	Reproduction	1	
	17/3/2026	Alternation of generation of <i>Ephedra</i>	1	
	17/3/2026	Economical importance of Gymnosperm	2	
Tot. Lec.			60	60

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Academic Calendar

PRACTICAL Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany)	Paper: III
Course Code	USBOP 501	
Title	Plant Diversity III	
Credits	4	
Name of the Faculty	Dr. Firoj Yasin Shaikh	

Month	Day	Topic	ecture per Month
	20/11/2025	Study of stages in the life cycle of the following Bryophyta from fresh	4
	27/11/2025	<i>Marchantia</i>	4
	12-04-25	<i>Pelia</i>	4
	12-11-25	<i>Sphagnum</i>	4
	18/12/2025	Study of stages in the life cycles of the following Pteridophytes	4
	01-01-26	<i>Lycopodium</i>	4

	01-08-26	<i>Equisetum</i>	4
	15/1/2026	<i>Adiantum</i>	4
	22/1/2026	<i>Marselia</i>	4
	29/1/2026	Economic importance of Bryophyta	4
	02-05-26	Economic importance of Pteridophyta	4
	02-12-26	Types of Sporophytes in Bryophyta (from Permanent slides)	4
	26/2/2026	Types of Sori and Soral Arrangement in Pteridophyte	4
	03-05-26	Study of stages in the life cycles	4
	03-05-26	<i>Thuja</i>	4
	03-05-26	Gnetum	4
	03-12-26	<i>Ephedra</i>	4
	03-12-26	Economic importance of Gymnosperm	4
			60

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Practical Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany)		Paper: II
Course Code	USBOP502		
Title	PRACTICAL – PAPER II Plant Diversity IV		
Credits	1.5		
Name of the Faculty	Dr. Swati Sambhaji Kharade		

Month	Day / Date (Tuesday)	Topic	Batch	Lecture per Month
	Angiosperm-II			
Nov. 25	18-11-25	#REF!	A	2
	25-11-25	#REF!	A	
Dec. 25	02-12-25	#REF!	A	4
	09-12-25	#REF!	A	
Jan. 26	16-12-25	#REF!	A	
	23-12-25	#REF!	A	
	Anatomy II			
Feb. 26	06-01-25	#REF!	A	4
	13-01-25	#REF!	A	
	20-01-25	#REF!	A	
	03-02-25	#REF!	A	
Mar.26		Embryology		
	10-02-25	Study of various stages of Microsporogenesis, Megasporogenesis and Embryo Development with the help of permanent slides / photomicrographs	A	3
	17-02-25	Mounting of Monocot (Maize) and Dicot (Castor and Gram) embryo	A	
	24-02-25	In vivo growth of pollen tube in Portulaca/Vinca	A	
		Plant Geography		
	03-03-25	Study of phytogeographic regions of India	A	3
	10-03-25	Preparation of vegetation map using Garmin's GPS Instrument	A	
	17-03-25	Problems based on Simpson's diversity Index	A	
	24-03-25	Journal Certification	A	
Tot. Lec.				16

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Teaching Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany)			Paper: II
Course Code	USBO502			
Title	PLANT DIVERSITY IV			
Credits	2.5 Credits (60 Lectures)			
Name of the Faculty	Dr. Swati Sambhaji Kharade			
Month	Date	Topic	Lectures	Lecture per Month
		UNIT I: Angiosperms II	15	7
Nov. 25	17-11-25	Major botanic gardens of India- Introduction		
	21-11-25	Indian botanical garden-Howrah		
	22-11-25	National botanical Garden (NBRI) Lucknow		
	22-11-25	Lloyd botanical garden, Darjeeling		
	24-11-25	Lalbaugh or Mysore state botanical garden, Bangalore		
	28-11-25	Botanical survey of India- Introduction		
Dec. 25	29-11-25	Regional braches of Botanical survey of India		
	01-12-25	Study of following plant families- Rhamnaceae		13
	05-12-25	Study of following plant families- Combretaceae		
	06-12-25	Study of following plant families- Asclepidaceae		
	06-12-25	Study of following plant families- Labiatae		
	08-12-25	Study of following plant families- Euphorbiaceae		
Jan. 26	12-12-25	Study of following plant families- Cannaceae		
	13-12-25	Hutchinson classification- Merits		
	13-12-25	Hutchinson classification- Demerits		
		Unit II: Anatomy II	15	
	15-12-25	Ecological anatomy- Introduction		
	19-12-25	Hydrophytes-Submerged-Hydrilla		
	20-12-25	Hydrophytes-Floating-Nymphaea		
	20-12-25	Hydrophytes-Rooted-Eichhornia		
	22-12-25	Hydrophytes- Typha		
	02-01-26	Mesophytes- Vinca		18
	03-01-26	Sciophytes- Peperomia		
	03-01-26	Halophytes- Avicennia		
	05-01-26	Halophytes- Portulaca		
	09-01-26	Epiphytes- Orchid		
	10-01-26	Xerophytes- Opuntia		
	10-01-26	Xerophytes- Nerium		
	12-01-26	Xerophytes- Aloe vera		
	16-01-26	Revision of hydrophytes, hygrophytes, mesophytes and sciophytes.		
Feb. 26	17-01-26	Revision of halophytes, epiphytes, xerophytes		
		UNIT : III Embryology	15	
	17-01-26	Unit 3: Embryology- Introduction		
	19-01-26	Microsporogenesis		
	23-01-26	Development of male gametophyte		
	24-01-26	Megasporogenesis		
	24-01-26	Development of female gametophyte		
	30-01-26	Development of monosporic type		
	31-01-26	Examples of all embryo sac- introduction		
	31-01-26	Monosporic, Normal or Polygonum Type		
	02-02-26	Bisporic or Allium Type		16
	06-02-26	Tetrasporic Type		
	07-02-26	Types of ovules-orthotropous or anatropous ovules, anatropous ovule		
	07-02-26	hemi-anatropous ovule or hemitropous ovule, campylotropous ovule, amphitropous ovule, and circinotropous ovule.		
	06-02-26	Double fertilization		
	13-02-26	Development of embryo-Capsella		
	14-02-26	Revision		
		UNIT: IV Plant Geography	15	
	14-02-26	Unit 4: Plant Geography- Introduction		
	16-02-26	Phytogeographical regions of India		
	20-02-26	Biodiversity- Definition, diversity of flora found in various forests types of India		
	21-02-26	Types of forest		

Mar. 26	21-02-26	Evolution of biodiversity with one example of an evolutionary tree		4
	23-02-26	Levels of biodiversity		
	27-02-26	Importance of biodiversity		
	28-02-26	Status of biodiversity		
	28-02-26	Loss of biodiversity		
	02-03-26	Conservation of biodiversity		
	06-03-26	Genetic diversity- Molecular characteristics		
	07-03-26	Revision		
	07-03-26	Question paper discussion		
Tot. Lec.			60	

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Academic Calendar

PRACTICAL Plan for Semester-IV Year: 2025-2026

Course	S.Y.B.Sc. (Botany)	Vertical – I	Course: III
Course Code	Major (Scheme III)		
Title	Practical Approaches in Plant Sciences II		
Credits	1 Credits (30 lectures)		
Name of the Faculty	Dr. Swati Sambhaji Kharade		

Month	Day / Date (Monday)	Topic	Batch	Lecture per Month
	List of Practicals (External)			1
Nov. 25	24-11-25	E1: To study the life cycle of Pinus. (Vegetative /reproductive structures)	A	
Dec. 25				4
	01-12-25	E2: Types of Inflorescences (any one example of each type)	A	
	08-12-25	E3: Study of Families: Rubiaceae- Classification, Morphological peculiarities, Floral Formula, and Economic importance.	A	
	15-12-25	E3: Study of Families: Malvaceae - Classification, Morphological peculiarities, Floral Formula, and Economic importance.	A	
	22-12-25	E3: Study of Families: Amaryllidaceae - Classification, Morphological peculiarities, Floral Formula, and Economic importance.	A	
Jan. 26	List of Practicals (Internal)		A	3
	05-01-26	I1. Study of different types of fossils- (with the help of photo)		
		12-01-26	I2. Study of Leaf morphology. (As per theory)	
Feb. 26	19-01-26	I3. Garden Locations (Hedges, Edges, Lawn, Arch and pergola, Avenue, Flower Beds Rock Garden and Water Garden).	A	2
			A	
	02-02-26	I4. Preparation of Garden Plans: Formal and Informal Gardens.		
	09-02-26	Revision and Certification	A	10
		Certification	A	
		Tot. Lec.		

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Academic Calendar

Teaching Plan for Semester-IV Year: 2025-2026 (NEP 2020)

Course	S.Y.B.Sc. (Botany)	Vertical – I	Course: II
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Course Code	Major (Scheme III)			
Title	Plant Diversity-II			
Credits	2 Credits (30 lectures)			
Name of the Faculty	Dr. Swati Kharade			
Month	Date	Topic	Lectures	Lecture per Month
	Module 1: Gymnosperms and Paleobotany		15	
Nov. 25	22-11-25	Gymnosperms and Paleobotany - Introduction		3
	24-11-25	1. Gymnosperms: The Giants of Plant World- Introduction		
	29-11-25	General classification of Gymnosperms up to the order per (Chamberlain 1934).		7
Dec. 25	01-12-25	Interesting facts about gymnosperms.		
	06-12-25	General characters of Coniferophyta.		
	08-12-25	Systematic position (Chamberlain, 1934)		
	13-12-25	life cycle (excluding developmental stages of sex organs) of Pinus.		
	15-12-25	2. Palaeobotany- Introduction		
	20-12-25	Geological Time Scale -Era, period		
	22-12-25	Evolutionary changes in plants		
Jan. 26	03-01-26	The importance of Palaeobotany.		8
	05-01-26	Formation and types of Fossils,		
	10-01-26	Interesting facts about fossils.		
	12-01-26	Birbal Sahni Institute of Palaeobotany, Lucknow.		
	17-01-26	Revision		
	Module 2: Plant morphology and Gardening		15	
	19-01-26	Plant morphology and Gardening- Introduction		
	24-01-26	1. Leaf: The Powerhouse- Introduction		
	31-01-26	Parts of typical leaves,		
Feb.26	02-02-26	Types of leaves- Simple and Compound,		9
	07-02-26	Venation: Introduction, Types		
	09-02-26	Phyllotaxy: Introduction, Types		
	14-02-26	2. Inflorescence: The Art of Floral Cluster in Nature- Introduction		
	16-02-26	Types of inflorescences- Racemose, Cymose and Special Inflorescence		
	21-02-26	3. Garden designing: Merging Science and Aesthetics- Introduction		
	12-02-26	Types of garden-Formal and Informal -Features		
	23-02-26	Garden Locations (Hedges, Edges, Lawn, Arch and Pergola).		
	28-02-26	Garden Locations (Avenue, Flower Beds, Rock Garden and Water Garden).		
Mar. 26	02-03-26	Gardens in India -Jijamata Udyan, Byculla;		5
	07-03-26	Gardens in India - Maharashtra Nature Park, Mahim;		
	09-03-26	Gardens in India - Government Botanical Garden, Ooty.		
	14-03-26	Revision		
	16-03-26	Question paper discussion		
		Tot. Lec.	30	32

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Teaching Plan for Semester-IV Year: 2025-2026 (NEP 2020)

Course	S.Y.B.Sc. (Botany)	Vertical – 4	Course: II
Course Code	(Scheme III) VSC		
Title	Plant Tissue Culture (VSC-2)		
Credits	2 Credits (60 lectures)		

Name of the Faculty		Dr. Swati Kharade		
Month	Date	Topic	Lectures	Lecture per Month
Nov. 25	19-11-25	E1. Sterilization techniques in plant tissue culture:		2
	26-11-25	E2. Wet Sterilization - Autoclave		
Dec. 25	03-12-25	E3. Dry Sterilization - Hot air oven, Flame Sterilization		4
	10-12-25	E4. Laminar airflow chamber		
	17-12-25	E5. Chemical Sterilization		
	24-12-25	E6. Ultrafiltration		
Jan. 26	07-01-26	E7. Surface sterilization of Explant.		4
	14-01-26	E8. Preparation of Murashige & Skoog's (MS) media of given concentration from stock solutions.		
	21-01-26	E9. Inoculation of explant and regeneration.		
	28-01-26	E10. Callus induction from regenerated explant.		
	04-02-26	E11. Visit to a Plant Tissue Culture laboratory and submission of report.		
Feb. 26	11-02-26	I1. Designing of Plant Tissue Culture Laboratory		4
	18-02-26	I2. Preparation of Synthetic seeds.		
	25-02-26	I3. Hardening and acclimatization of regenerated Plantlets.		
	04-03-26	Discuss practical question paper, Journal Checking, Journal Certification		
Mar. 26				1

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Teaching Plan for Semester-II Year: 2025-2026 (NEP 2020)

Course	F.Y.B.Sc. (Botany)		Vertical – 1	Course: II
Course Code	Major (Scheme III)			
Title	Practical -2			
Credits	2 Credits (60 lectures)			
Name of the Faculty		Dr. Swati Kharade		
Month	Date	Topic	Lectures	Lecture per Month
Nov. 25	25 & 27-11-2025	Recapturing of Botany, Practical syllabus discussion		2
Dec. 25	02 & 04-12-2025	Study of vegetative and reproductive structures of Adiantum.		8
	09 & 11-12-2025	Study of vegetative and reproductive structures of Cycas.		
	16 & 18-12-2025	Morphology of Non-essential whorls-Calyx and Corolla.		
	23 & 25-12-2025	Morphology of Essential whorls. Androecium and Gynoecium.		
Jan. 26	06 & 08-01-2026	Study of various stages of mitosis in root tip cells (Allium).		6
	13 & 15-01-2026	To perform karyotyping on root tip cells of Allium cepa to observe and analyse chromosome morphology.		
	20 & 22-01-2026	Calculation of mean, median and mode, standard deviation.		
Feb. 26	03 & 05-02-2026	Graphical representation of data: Frequency polygon, Histogram, Ogive, Bar diagram, Pie-charts. (Using Excel Sheet)		8
	10 & 12-02-2026	Morphological Adaptations of plants. (Mesophytes, Xerophytes). (Identification)		
	17 & 19-02-2026	Morphological Adaptations of plants. (Hydrophytes, Halophytes, Epiphytes). (Identification)		
	23 & 25-02-2026	Field Visit: Exploration of In-Situ / Ex-Situ Conservation Methods in Botany (Visit)		
Mar. 26	02 & 04-03-2026	Collection of seed of wild plants from natural habitat and preparation of Seed bank (Ex-situ) and Seed bal		2
	09 & 11-03-2026	Discuss practical question paper, Journal Checking, Journal Certification		
				13

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Academic Calendar

Theory Plan for Semester-IV Year: 2025-2026

Course	S.Y.B.Sc. (Botany) SEM IV	Vertical – 1	Course: III
Course Code	Minor (Scheme III)		
Title	Theory Integrated Approaches in Plant Sciences II		
Credits	2 Credits (30 lectures)		
Name of the Faculty	Mr. Rahim A. Bagwan		

Month	Date	Topic	Lecture per Mon
		Module 1: Spermatophyta and Gardening	
November		1. Gymnosperms:	10
	11-10-25	Interesting facts about gymnosperms.	
	11-11-25	Systematic position (Chamberlain,1934) of <i>Pinus</i>	
	11-11-25	Morphology of <i>Pinus</i> .	
	17/11/2025	Anatomy of <i>Pinus</i>	
	18/11/2025	Developmental stages and sex organs of <i>Pinus</i> .	
	18/11/2025	Life cycle of <i>Pinus</i>	
	24/11/2025	Test	
	25/11/2025	2. Angiosperms:	
	25/11/2025	Parts of typical leaves	
December	12-01-25	Types of leaves- Simple and Compound	12
	12-02-25	Leaf Modifications in plants -Types - Phyllode, Tendrils	
	12-02-25	Thorns and Spines	
	12-04-25	Types of inflorescences- Racemose and Cymose	
	12-09-25	Special Inflorescence	
	12-09-25	Test	
	15/12/2025	3. Garden designing	
	16/12/2025	Garden Plan - Objectives, types and characteristics.	
	16/12/2025	Garden Features - Fences and Path	
	22/12/2025	Lawn, Topiary and Hedges	
	23/12/2025	Edges and Lawn	
	23/12/2025	Arch and Pergola	
January	01-05-26	Avenue and Flower Beds	11
	01-06-26	Test	
	01-06-26	Module 2: Anatomy, Plant Physiology, Biostatistics	
	01-12-26	1. Anatomy	
	13/01/2026	Meristem- Definition	
	13/01/2026	Characteristics, types, and functions.	
	19/01/2026	Meristem functions.	
	20/01/2026	Permanent tissues in plants Definition	
	20/01/2026	Permanent tissues in plants - Types, structure and functions.	
	27/01/2026	Normal Secondary growth in dicot root	
	27/01/2026	Normal Secondary growth in dicot stem.	
February	02-02-26	Test	12
	02-03-26	2. Plant Physiology	
	02-03-26	Respiration - Introduction,	
	02-09-26	Types of Respiration	
	02-10-26	Aerobic respiration	
	02-10-26	Glycolysis	
	16/2/2026	Krebs cycle	
	17/2/2026	ETS	
	17/2/2026	Anaerobic respiration	
	23/2/2026	Test	
	24/2/2026	3. Biostatistics	
	24/2/2026	Coefficient of correlation Introduction, Define	
March	03-02-26	Regression analysis Introduction, Define	10
	03-09-26	Coefficient of correlation Problem	
	03-10-26	Regression analysis Problem	
	03-10-26	Revision	
	16/3/2026	PPT	
	17/3/2026	Test	
	17/3/2026	Final Test	
	23/3/2026		
	03-04-26		
	24/3/2026		

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Academic Calendar

Theory Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany) SEM VI		
Course Code	USBO603		
Title	(Theory) FORMS AND FUNCTION – III		
Credits	2.5 Credits (60 lectures)		
Name of the Faculty	Mr. Rahim A. Bagwan		

Month	Date	Topic	Lecture per Mon
		Unit I: Plant Biochemistry	
November	11-10-25	Syllabus discussion	9
	14/11/2025	Define Carbohydrates, character of carbohydrates	
	15/11/2025	Structure of Carbohydrates (sugars)	
	17/11/2025	Structure of biomolecules: Carbohydrates (starch)	
	21/11/2025	Structure of biomolecules: Carbohydrates (starch, cellulose, pectin)	
	22/11/2025	Define Lipids and types	
	24/11/2025	Lipids (fatty acids and glycerol)	
	28/11/2025	Proteins (amino acids)	
	29/11/2025	Enzymes: Nomenclature, classification	
December	12-01-25	Enzymes: function, Mode of action, Enzyme	10
	12-05-25	Enzyme kinetics	
	12-06-25	Michaelis-Menten equation, competitive Inhibitor	
	12-08-25	noncompetitive and un-competitive inhibitors.	
	12-12-25	Unit II: Plant Physiology II	
	13/12/2025	Define Nitrogen metabolism	
	15/12/2025	Nitrogen cycle, Root nodule formation	
	19/12/2025	Leghaemoglobin	
	20/12/2025	Nitrogenase activity	
	22/12/2025	Assimilation of nitrates	
January	01-02-26	(NR, NiR activity)	13
	01-03-26	Assimilation of ammonia	
	01-05-26	(amination and transamination reactions)	
	01-09-26	Nitrogen assimilation and carbohydrate utilization.	
	01-10-26	Physiological effects of Auxins	
	01-12-26	commercial applications of Auxins	
	16/1/2026	Physiological effects Gibberellins	
	17/1/2026	commercial applications of Gibberellins	
	19/1/2026	Physiological effects and commercial applications of Cytokinins	
	23/1/2026	Physiological effects and commercial applications of Absciscic acid	
	24/1/2026	Unit III: Genetics	
	30/1/2026	Explain Genetic mapping, Genetic mapping in eukaryotes	
	31/1/2026	Discovery of genetic linkage	
February	02-02-26	Gene recombination, Construction of genetic maps	12
	02-06-26	Three- point crosses	
	02-07-26	Explain Mapping chromosomes	
	02-09-26	Mapping chromosomes, problems based on the same	
	13/2/2026	Gene mutations: definition	
	14/2/2026	Gene mutations: types of mutations	
	16/2/2026	Causes of mutations, induced mutations	
	20/2/2026	Ame's test	
	21/2/2026	Metabolic disorders	
	23/2/2026	Metabolic disorders– enzymatic	
	27/2/2026	Metabolic disorders of non-enzymatic	
	28/2/2026	Gene control of enzyme	
	03-02-26	Gene control of enzyme structure Garrod's hypothesis of inborn errors of metabolism	
	03-06-26	Phenyl ketone urea	
	03-07-26	Unit IV: Biostatistics (Shifted from Paper – II)	
	03-09-26	What is t-test, explain	
	13/3/2026	Test of significance student's t-test – Paired	

March	14/3/2026	Test of significance student's t-test – Paired example practices	13
	16/3/2026	Test of significance student's t-test – Unpaired.	
	20/3/2026	Test of significance student's t-test – Unpaired example practices	
	23/3/2026	Regression define and explain	
	27/3/2026	Regression examples	
	28/3/2026	ANOVA define and explain in detail	
	30/3/2026	ANOVA (one way) examples practices	
		test and question practices	

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Practical Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany) SEM VI		
Course Code	USBOP603		
Title	Practical FORMS AND FUNCTION – III		
Credits	1.5 Credits		
Name of the Faculty	Mr. Rahim A. Bagwan		

Month	Date	Topic	Practical per Mo
November	15/11/2025	Plant Biochemistry	2
	22/11/2025	Estimation of proteins by Biuret method	
	29/11/2025	Effect of temperature on the activity of amylase	
December	12-06-25	Effect of pH on the activity of amylase	2
	13/12/2025	Effect of substrate variation on the activity of amylase	
	20/12/2025	Plant Physiology II	
January	01-03-26	Determination of alpha-amino nitrogen	4
	01-10-26	Effect of GA on seed germination	
	17/1/2026	Estimation of reducing sugars by DNSA method	
	24/1/2026	Genetics	
	31/1/2026	Problems based on three-point crosses, construction of chromosome maps	
February	02-07-26	Identification of types of mutations from given DNA sequences	3
	14/2/2026	Study of mitosis using pre-treated root tips of Allium	
	21/2/2026	Biostatistics	
	28/2/2026	t-test (paired and unpaired)	
March	03-07-26	Problems based on regression analysis	3
	14/3/2026	ANOVA (One Way)	
	28/3/2026	Practical discussion	

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Theory Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany) SEM VI		
Course Code	USACHO601		
Title	(Theory) Horticulture and Gardening -III (SEM-VI)		
Credits	2 Credits (60 Lectures)		
Name of the Faculty	Mr. Rahim A. Bagwan		

Month	Date	Topic	Lecture per Mon
		Unit 1 LANDSCAPE GARDENING	
November	11-11-25	Syllabus discussion	9
	11-12-25	Principles of landscaping and Principles of garden design.	
	13/11/2025	Indoor plants and Garden	
	18/11/2025	Indoor gardens- Hydroponics	
	19/11/2025	Terrarium, Bottle garden, Dish garden	
	20/11/2025	Important garden features- Paths, Avenues, Hedges, Edges	
	25/11/2025	Lawn Flowerbeds, Arches& Pergolas	
	26/11/2025	Fencing, Water bodies, Rock garden	
	27/11/2025	Plants suitable for different locations & climates.	
	12-02-25	Lawn- Purpose	

December	12-03-25	Lawn- preparation of lawn,		11
	12-04-25	Method of preparation of lawn		
	12-09-25	management of lawn		
	12-10-25	lawn plants		
	12-11-25	Soil manipulation for plantation of desirable varieties.		
	16/12/2025	Mughal, Buddist		
	17/12/2025	Botanical garden		
	18/12/2025	Vertical wall garden & Theme park		
	23/12/2025	Important Gardens of India—Shalimar (Shrinagar), Vrindavan(Mysore),		
	24/12/2025	Veer Jijamata Udyan(Mumbai)		
		Unit 2 - HORTICULTURE PRODUCE		
January	01-06-26	Hightech Horticultural production		12
	01-07-26	Green house technology- Meaning,		
	01-08-26	types, layout & construction		
	13/1/2026	irrigation systems.		
	14/1/2026	Care & attention. Hardening of plants. Space gardens.		
	15/1/2026	Floriculture – Scope & importance, soil and climatic requirement		
	20/1/2026	cultivation practices and Economics of green house production of Gerbera,		
	21/1/2026	Carnation, Roses, Orchids.		
	22/1/2026	Propagation techniques, packing and marketing, enhancing and delaying		
	27/1/2026	period of bloom by special methods.		
	28/1/2026	Floral decoration, Florist shop management.		
		UNIT-3 COMMERCIAL PRODUCTION		
February	29/1/2026	Commercial production of the following – in relation to propagation		11
	02-03-26	post plantation care, harvesting, post harvest management & varieties		
	02-04-26	Tubers- potato		
	02-05-26	Vegetables- Tomato		
	02-10-26	Fruits- Mango, Grapes & Coconut- products like coco peat/ Coir etc.		
	02-11-26	Spices/condiments- chilly		
	02-12-26	Medicinal plants- <i>Aloe vera</i> , <i>Stevia rebaudina</i> (Madura)		
	17/2/2026	Aromatic plant- <i>Citronella</i> , <i>Patchouli</i>		
		UNIT 4 POST HARVEST TECHNOLOGY & ENTREPRENEURSHIP IN HORTICULTURE		
	18/2/2026	Maturity- Factors responsible for maturity		
		Ripening methods used for delaying ripening.		
	24/2/2026	Maturity- Factors responsible for maturity		
	25/2/2026	ripening methods used for delaying ripening.		
	26/2/2026	Harvest- Time of harvest, harvesting and handling of harvested products		
March	03-04-26	Storage of fresh produce- Types of storage of fruits & vegetables		9
	03-05-26	Fruit & vegetables preservation technology.		
	03-10-26	Marketing- grading, packing & transportation. Ways of increasing the marke		
	03-11-26	Value and shelf life of horticultural produce.		
	03-12-26	Horticultural business, management and Entrepreneurship development		
	17/3/2026	Horticulture as a business definition and nature, organization, planning		
	18/3/2026	Operation of Horticulture farm business.		
	24/3/2026	Test and question paper practices		
	25/3/2026	Test and question paper practices		

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Practical Plan for Semester-VI Year: 2025-2026

Course	T.Y.B.Sc. (Botany) SEM VI		
Course Code	USACHO601 Practical		
Title	(Practical) Horticulture and Gardening -III (SEM-VI)		
Credits	2 Credits (60 Lectures)		
Name of the Faculty	Mr. Rahim A. Bagwan		

Month	Date	Topic	Practical per Mon
November	11-12-25	Herbs – foliage any 2 and flowering any 2	3
	19/11/2025	2. Shrubs – foliage any 2 flowering any 2	
		3. Trees – foliage any 2 and flowering any 2	
	26/11/2025	4. Climbers – any 2	
	12-03-25	5. Lianas – any 2	

December	12-09-25	6. Epiphytes – any 2		4
	12-10-25	7. Creepers –any 2		
	17/12/2025	8. Trailers – any 2		
	24/12/2025	9. Aquatic plants – any 3 (preferably various habitat)		
January	01-07-26	10. Succulents – any 2		4
	14/1/2026	11. Weeds –any 10		
	21/1/2026	Flower arrangements –Indian Gajara , veni		
	28/1/2026	Flower arrangements - garland		
February	02-04-26	bouquet - Baskets , hand torch type , table floral arrangement Japanese and western all type		4
	02-11-26	Preparation of Jams, Jellies, Squashes/ Syrups, Pickle, sauces		
	18/2/2026	Preparation of Jellies		
	25/2/2026	Preparation of Squashes and Syrups		
March	03-04-26	Preparation of Pickle and sauces		4
	03-11-26	Fruit & vegetable carving		
	18/3/2026	Bio-jewelery		
	25/3/2026	Green house plants- Information regarding to soil, temperature, irrigation, fertilizer requirements and propagation methods for Anthurium, Gerbera, Orchids, Tuberose, Carnation, Roses, Capsicum		