

DEPARTMENT OF BOTANY
GOVT. DEGREE COLLEGE NOWSHERA



ESTABLISHMENT OF DEPARTMENT

- Government Degree College Nowshera was established under Prime Minister Reconstruction Programme in 2008.
- Initially it started functioning from the premises of the Govt. Middle School, Nowshera.
- In the session 2016-17, the college shifted to its new campus built at Darshan Nagar.
- The department of Botany was established with the introduction of the Science stream in the session 2016-17.

VISION

- To provide modern, skill oriented and quality education to students in plant sciences.
- To establish high standard teaching in recent plant science based approaches.
- To develop interest and enthusiasm among the students towards the subject.
- To train the students of this rural area in the skill of mushroom cultivation so that they become self reliant.

MISSION

- To develop the students into highly skilled botanists.
- To instill the values of biodiversity conservation among the students.
- To cultivate ethical values and make responsible citizens.

TEACHING PROFILE

DETAILS OF TEACHING STAFF

- Teaching posts sanctioned: 01
- Teaching posts filled: 01
- Faculty on Academic Arrangement basis: 01
- Total teaching faculty: 02

Prof. Pooja Devi (Assistant Professor, Botany)

Academic Credentials: M.Sc., M.Phil., NET

Teaching Experience: 04 years (GDC Nowshera, Rajouri)

Research Paper Publications:

No. of Publications: 02

- Bhavana Sharma, Pooja Devi, Veenu Kaul; **“Phenological Clock of *Solanum villosum* Mill.”** [The International journal of Plant Reproductive Biology, 2019 Vol. 11 No. 2 pp. 187-188 ref.7]
- Manisha Kanchru, Pooja Devi; **“Current Status of Municipal Solid Waste Management in Jammu and Kashmir: A Review”**, International Journal of Research, 2022 Vol. 9, Issue 1.

Workshops Attended: 02

- Attended One Day Workshop on **“Mushroom Cultivation: Avenues and Challenges”** Held on 27th of November, 2020 in virtual mode by GDC Poonch.



- National seminar on **“Yoga as a Holistic Approach to Life”** organized by Higher Education Department, J&K on 20/06/2020
- National Seminar on **“Ethnobotany and Traditional Knowledge in Biodiversity Conservation”** organized by BGSBU, Rajouri; 8th -9th March, 2018

Faculty Development Programmes/Orientation Courses/ Refresher Courses Attended: 03

- Participated in **Five days FDP** on **“Assessment, Accreditation And Quality Assurance In Higher Educational Institutions”** organized by V.H.N. Senthikumara Nadar College, Tamilnadu and PEARL- A Foundation for Educational Excellence, Bengaluru, Karnataka from 20.07.20 to 24.07.2020
- Attended **4-Week Induction/Orientation Programme for “Faculty in Universities, Colleges/Institutes of Higher Education”** organised by Teaching Learning Centre, Ramanujan College, University of Delhi w.e.f. 15th of March to 14th of April, 2021.
- Attended **Two-weeks Refresher Course in Life Sciences** organised by UGC Human Resource Development Centre, Univ. of Jammu, Jammu w.e.f. 23.07.19 to 05.08.19.

Special Achievements:

- Started a **Botanical Garden** and **Herbal Garden** in the college.
- Started **Cultivation of Oyster mushrooms** (Dhingari) in the college and
- Trained Faculty members and students of college, especially girls in cultivation of oyster mushrooms.
- Trained students of Sem-V (Skill Course) in **preparation of Value-added products of mushrooms.**
- Organized a **Community Awareness Programme** for women of rural area.

REPRESENTATION IN COLLEGE COMMITTEES:

- **CONVENER:-** Cultural Committee, Internal Complaint Committee Against Sexual Harassment, Women Empowerment Cell, RTI Committee, Red Ribbon Club, Local Fund Committee.
- **MEMBER:-** IQAC, College Development Committee, Purchase Committee, Discipline Committee, Time-Table Committee, Students Welfare Committee, Students Grievances redressal Committee, Library Committee, Local Fund Committee, Literary Committee, Sports Committee, College Canteen Committee, Guidance and Counselling Cell, IT Committee, Advisory Committee, College Printing and Publication Committee, Equal Opportunity Cell, Digital Initiative Committee, Anti-Drugs and Rehabilitation Cell, N-LIST Committee, Ek Bharat Shreshta Bharat, Science Club.

PARTICIPATION IN BOARD OF STUDIES MEETINGS:

- Attended meetings of Board of Studies during the sessions 2018-19 and 2020-21.

Dr. Arajmand Fruk (Academic Arrangement)

Academic Credentials: M.Sc, Ph.D Botany

Teaching Experience: 01 year as Guest faculty at Jamia Hamdard, New Delhi.

Publications/Book Chapters: 04



1. **Fruk, A., Siddiqi, T.O., Khan, M.I.R. and Ahmad, A., 2020. Modulation in growth, biochemical attributes and proteome profile of rice cultivars under salt stress. *Plant Physiology and Biochemistry*, 146, pp.55-70.**
2. **Fruk, A., Ahmad, A. and Siddiqi, T.O., 2019. Proteomics Insights Into Salt Stress Signaling in Plants. In *Plant Signaling Molecules* (pp. 479-497). Woodhead Publishing.**
3. **Gulzar, B., Mujib, A., Rajam, M.V., Fruk, A. and Zafar, N., 2019. Identification of somatic embryogenesis (SE) related proteins through label-free shotgun proteomic method and cellular role in *Catharanthus roseus* (L.) G. Don. *Plant Cell, Tissue and Organ Culture (PCTOC)*, 137(2), pp.225-237.**

- Isah, T., Umar, S., Mujib, A., Sharma, M.P., Rajasekharan, P.E., Zafar, N. and **Frukh, A.**, 2018. **Secondary metabolism of pharmaceuticals in the plant in vitro cultures: strategies, approaches, and limitations to achieving higher yield.** *Plant Cell, Tissue and Organ Culture (PCTOC)*, 132(2), pp.239-265.

Seminars/International and National Conferences Attended: 10

- 30th March 2019: National Seminar on **“Emerging trends in life science, biotechnology and conservative strategies”**
- 26-27 March 2019: National Seminar on **“Biotechnology Research in India- Current status and Future prospects”** Department of Biotechnology, Jamia Hamdard.
- 29-30 April 2018: National Seminar on **“Medicinal Plants: Markets to Produced”** NESAs, New Delhi.
- 15-17 Dec 2016: International Seminar on **“New Frontiers in Cytogenetics and XIII Conference of the Society of Cytologists and Geneticists”** Dept. of Botany, University of Kerala.
- 21-22 Feb 2015: National Seminar on **“Science-led Development for Environmental sustainability”** NESAs, New Delhi.

- 10th Dec 2014: Mini Symposium on **“Applications of Flow Cytometry in Plant and Crop Research”** Jamia Hamdard.
- 1st April 2014: National Seminar on **“Medicinal Plant Research: Retrospect and Prospects”** UGC-SAP, New Delhi.
- 9th Oct 2013: National Seminar on **“Climate Change, Environment and Sustainable Development”** Jamia Hamdard.
- 26-27 Feb 2013: National Seminar on **“Medicinal Plants and their Characterization”** UGC-SAP, New Delhi.
- 16-17 March 2012: National Seminar on **“Medicinal Plants Research in India”** UGC-SAP, DRS-1, New Delhi.

Honors and Awards:

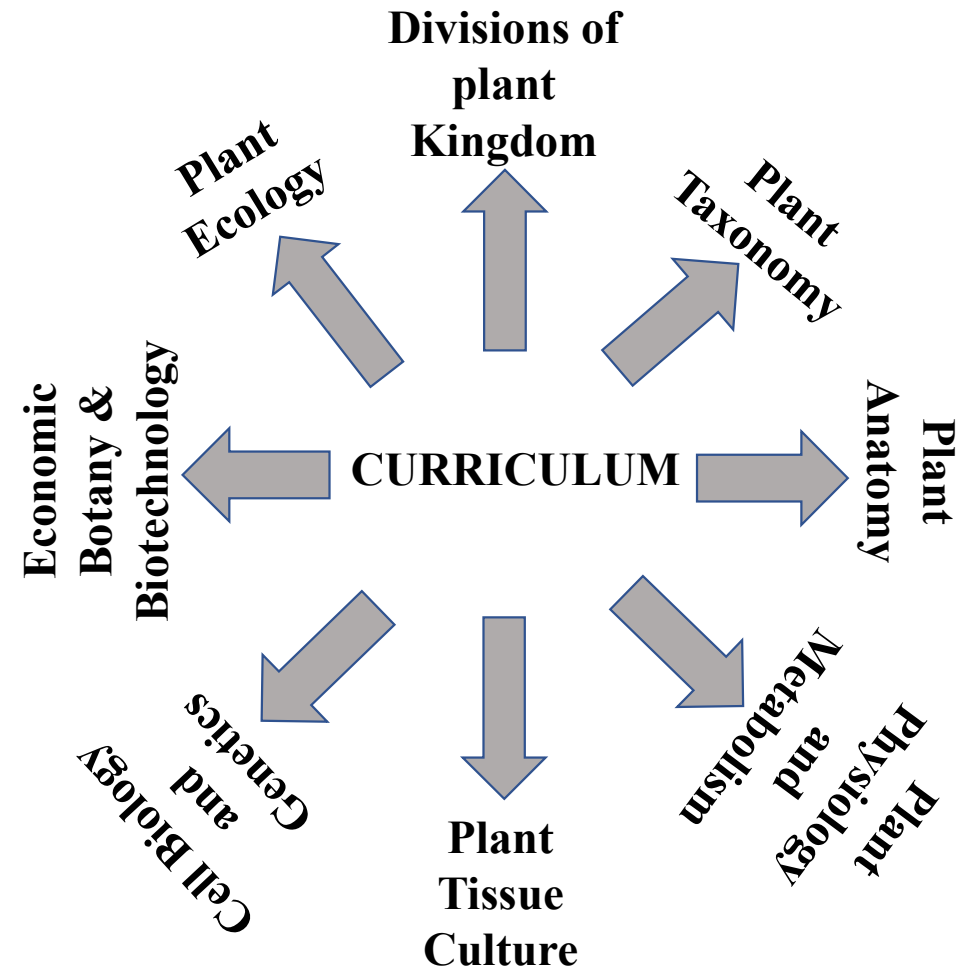
- Awarded **second prize** for the poster presentation by the society of Cytologists and Geneticists, India.
- Awarded **third prize** for the poster presentation in national seminar “Emerging trends in Life Sciences, Biotechnology and Conservation Strategies (ETLBCS), 30th March 2019.
- Awarded by **Certificate of Training** in Flow cytometry Basics at BD-JH FACS Academy, New-Delhi.
- Honored by **INSPIRE FELLOWSHIP** on 18th March 2013 by Govt. of India, Ministry of Science and Technology.
- Awarded **Gold Medal** for standing first in MSc Botany at Convocation held in March 2012 at Jamia Hamdard.
- Awarded by **Certificate of Merit** 2010-11 for **First position** in MSc Botany at Jamia Hamdard.

STUDENT ENROLLMENT

SESSION	SEM I	SEM II	SEM III	SEM IV	SEM V	SEM VI
2016-17	79	79	-	-	-	-
2017-18	62	56	39	39	-	-
2018-19	56	43	39	39	33	33
2019-20	60	39	39	39	29	29
2020-21	78	66	33	33	35	35
2021-22	68		68	-	33	-

CURRICULUM DESIGN AND DEVELOPMENT

- Botany is being taught to students of UG Semester I to VI under Choice Based Credit System (CBCS).
- As our college is affiliated to University of Jammu, the curriculum framed by the affiliating university is adopted.



TITLES OF COURSES BEING TAUGHT AT UG LEVEL

SEMESTER	COURSE NO.	TITLE	CREDITS	NATURE OF COURSE
I	UBOTC101	Diversity of microbes and Cryptogams	4	CORE
	UBOPC 102	Diversity of microbes and Cryptogams	2	CORE (PRACTICALS)
II	UBOTC 201	Characteristics and Systematics of seed plants	4	CORE
	UBOPC 202	Characteristics and Systematics of seed plants	2	CORE (PRACTICALS)
III	UBOTC 301	Plant Anatomy, Embryology and Ecology	4	CORE
	UBOPC 302	Plant Anatomy, Embryology and Ecology	2	CORE (PRACTICALS)
	UBOTS 303	Nursery, Gardening and Floriculture	4	SKILL ENHANCEMENT

SEMESTER	COURSE NO.	TITLE	CREDITS	NATURE OF COURSE
IV	UBOTC 401	Plant Physiology and Metabolism	4	CORE
	UBOPC 402	Plant Physiology and Metabolism	2	CORE (PRACTICALS)
	UBOTS 403	Ethnobotany	4	SKILL ENHANCEMENT
V	UBOTE 501	Cell Biology and Genetics	4	DSE/GE
	UBOPE 502	Cell Biology and Genetics	2	DSE/GE (PRACTICALS)
	UBOTS 503	Mushroom Cultivation Technology	4	SKILL ENHANCEMENT
VI	UBOTE 601	Economic Botany and Biotechnology	4	DSE/GE
	UBOTE 602	Economic Botany and Biotechnology	2	DSE/GE (PRACTICALS)
	UBOTS 603	Biofertilizers	4	SKILL ENHANCEMENT

TIME TABLE (2021-2022)

THEORY

Time	Class	Room No.	Name of Teacher
9:40 am-10:20 am	B.Sc. Sem I/II (Core)	05	Ms. Arajmand Fruk h
10:20am-11:00 am	B.Sc. Sem III/IV (Core)	02	Prof. Pooja Devi
11:40 am-12:20 pm	B.Sc. Sem V/VI (DSE)	05	Ms. Arajmand Fruk h
02:20pm-3:00 pm	B.Sc. Sem V/VI (SEC)	06	Prof. Pooja Devi

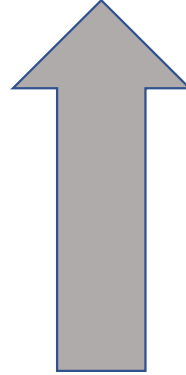
PRACTICALS

Time	Class	Roll nos.	Days of Week	Name of Teacher
9:00-11:00 am	B.Sc. Sem V/VI	51-66	Monday-Tuesday	Ms. Arajmand Fruk h
		67-83	Wed-Thursday	Prof. Pooja Devi
11:00-1:00 pm	B.Sc. Sem III/IV	51-72	Monday-Tuesday	Prof. Pooja Devi
		73-94	Wed-Thursday	Prof. Pooja Devi
		95-118	Fri-Saturday	Prof. Pooja Devi
1:00-3:00 pm	B.Sc. Sem I/II	102, 104-122	Monday-Tuesday	Ms. Arajmand Fruk h
		123-139; 141-143	Wed-Thursday	Ms. Arajmand Fruk h
		147-167	Fri-Saturday	Ms. Arajmand Fruk h

**PRACTICAL
LAB**



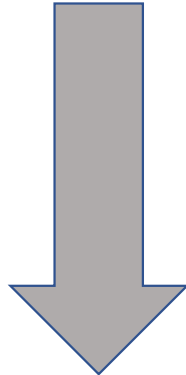
CLASS ROOMS



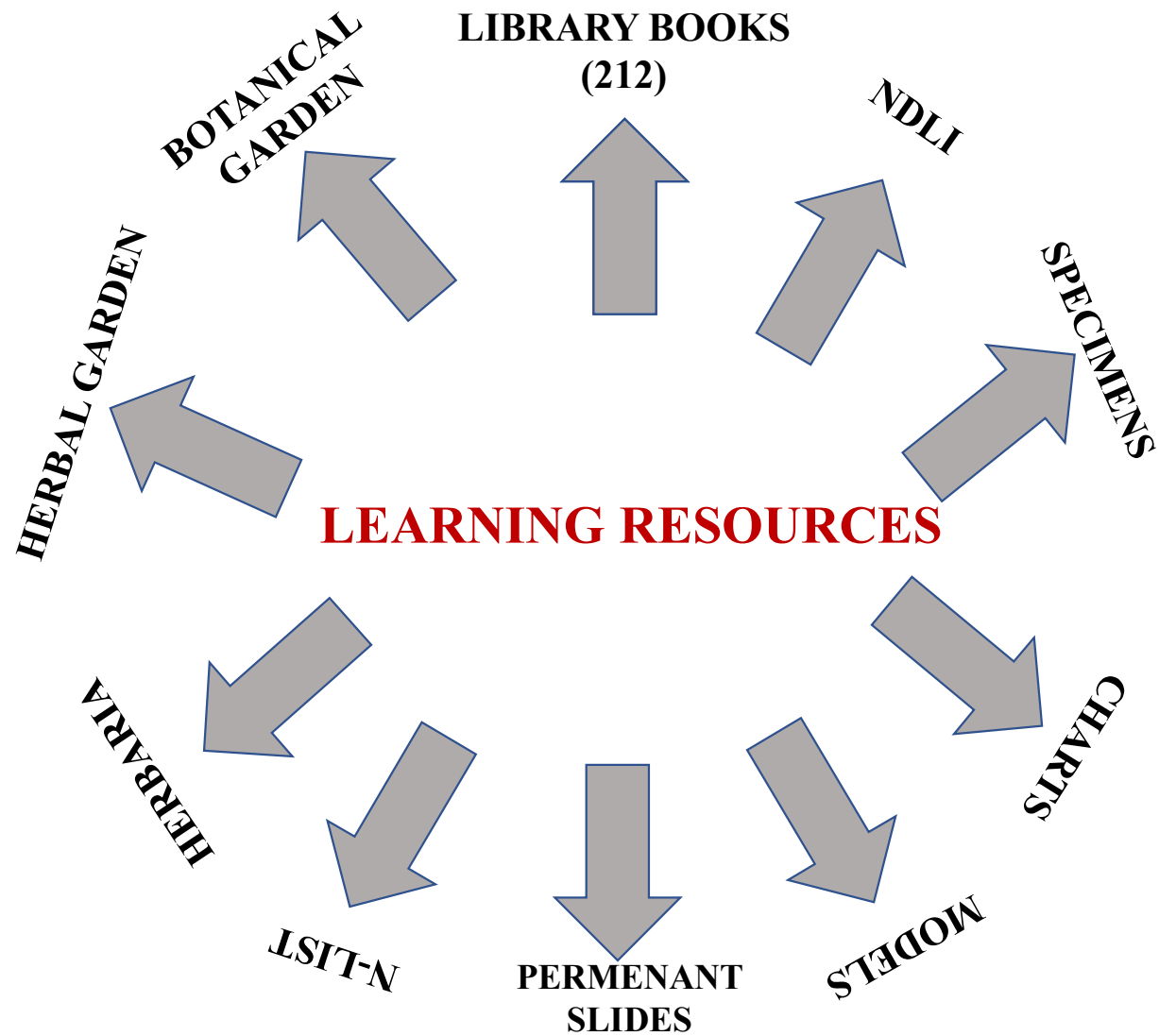
INFRASTRUCTURE



STAFF ROOM



STORE ROOM



EQUIPMENTS/INSTRUMENTS



**COMPOUND
MICROSCOPES**



**ELECTRIC
OVEN**



**DISECTING
MICROSCOPES**



**WEIGHING
BALANCE**



pH METRE



**MINI-
CENTRIFUGE**

ESTABLISHMENT OF BOTANICAL GARDEN

- Botanical Garden was established in the year 2019.
- One of the major objectives to establish botanical garden is to create and support collections of native taxa, and to build and maintain stocks of plants for ex situ conservation.
- Majority of the plants were donated by Mr. Ramesh Chander Sharma, a Govt. Teacher by profession, who runs a private Plant Nursery at Siot (Sunderbani, Distt. Rajouri).
- A fallow area was chosen and the saplings were planted in properly manured pits.
- The staff and students of the college also contributed to enrich the Botanical Garden.





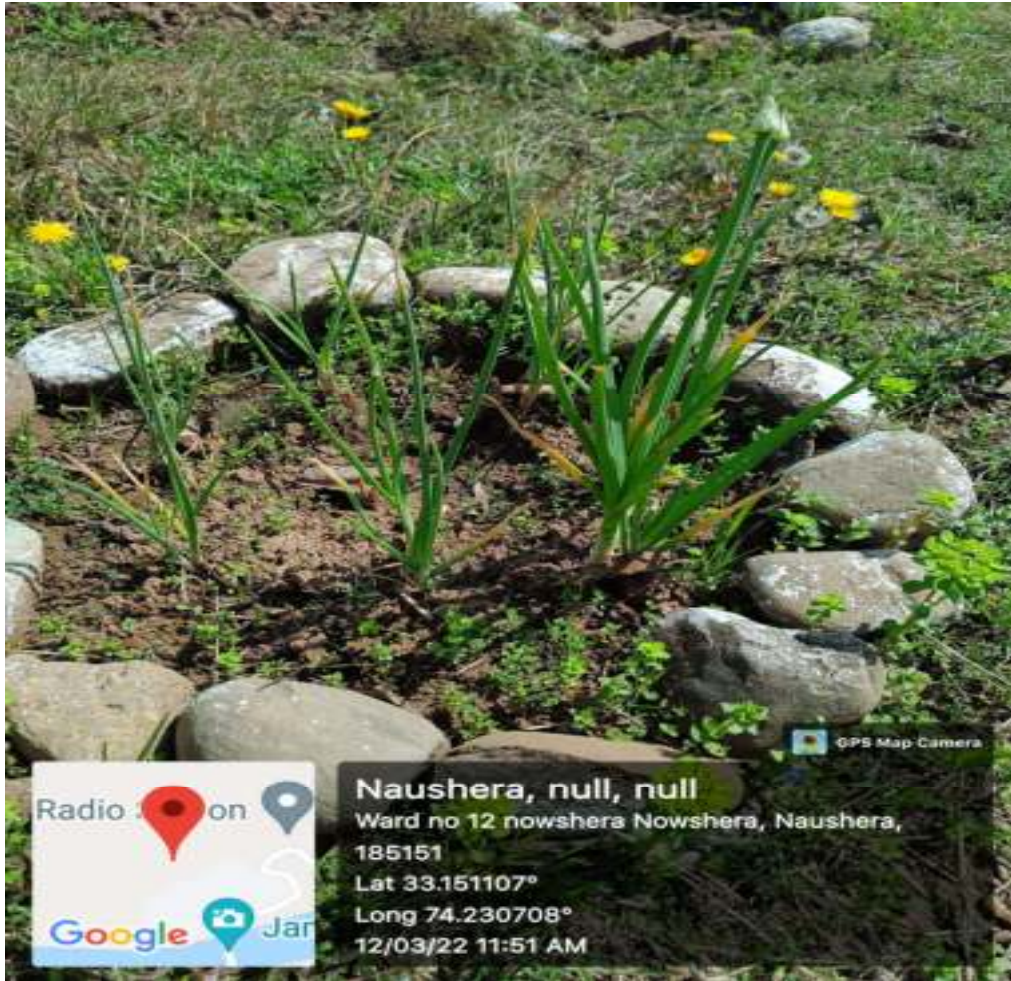
ESTABLISHMENT OF HERBAL GARDEN

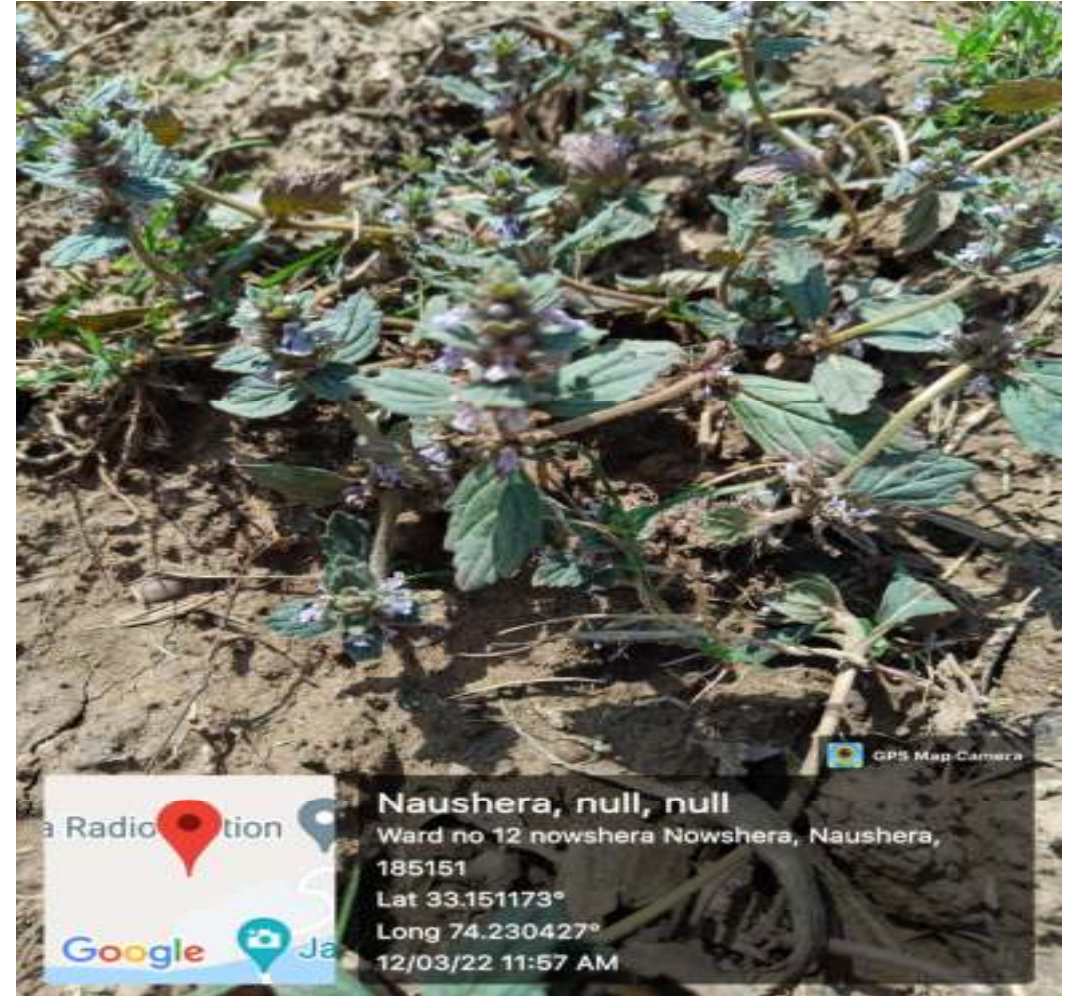
- Herbal Garden was started in the college in March, 2021.
- Its main objective was to create awareness of conservation and traditional uses of herbs and medicinal plants to students.
- A variety of herbal plants of medicinal importance such as aloe vera, kalanchoe (patharchatta), Murraya (curry-patta), Ashwagandha, Arjun, Bahera, Amla etc. are growing in the Herbal Garden.
- It shall be enriched with more plants in future.



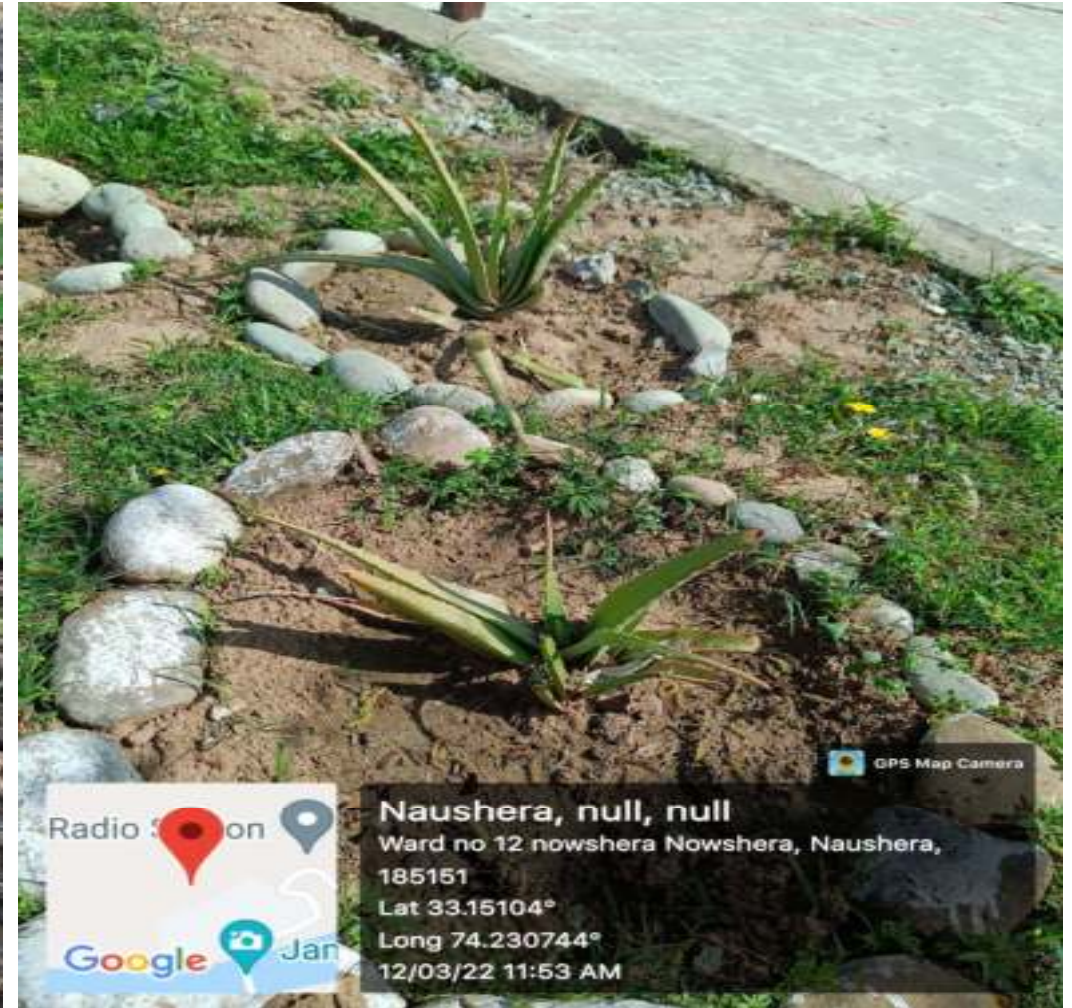


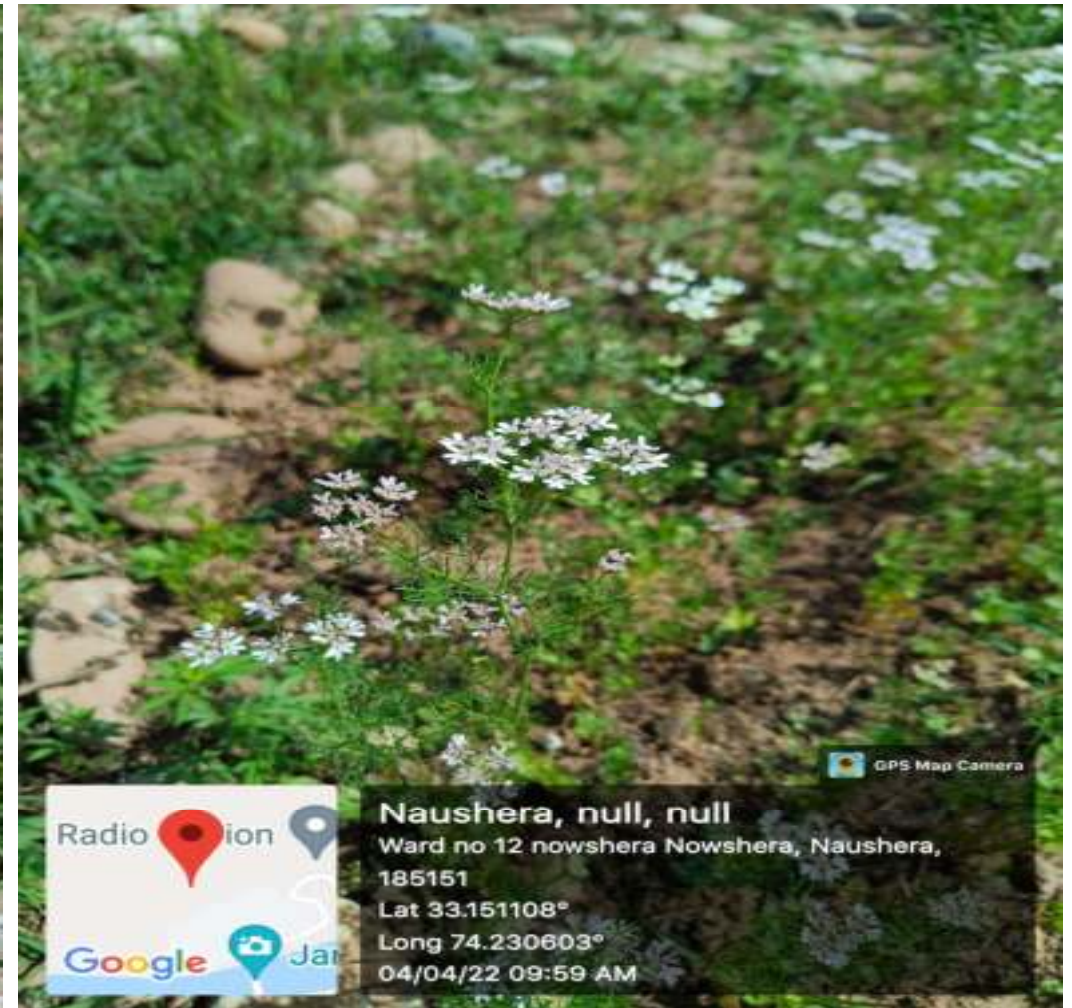
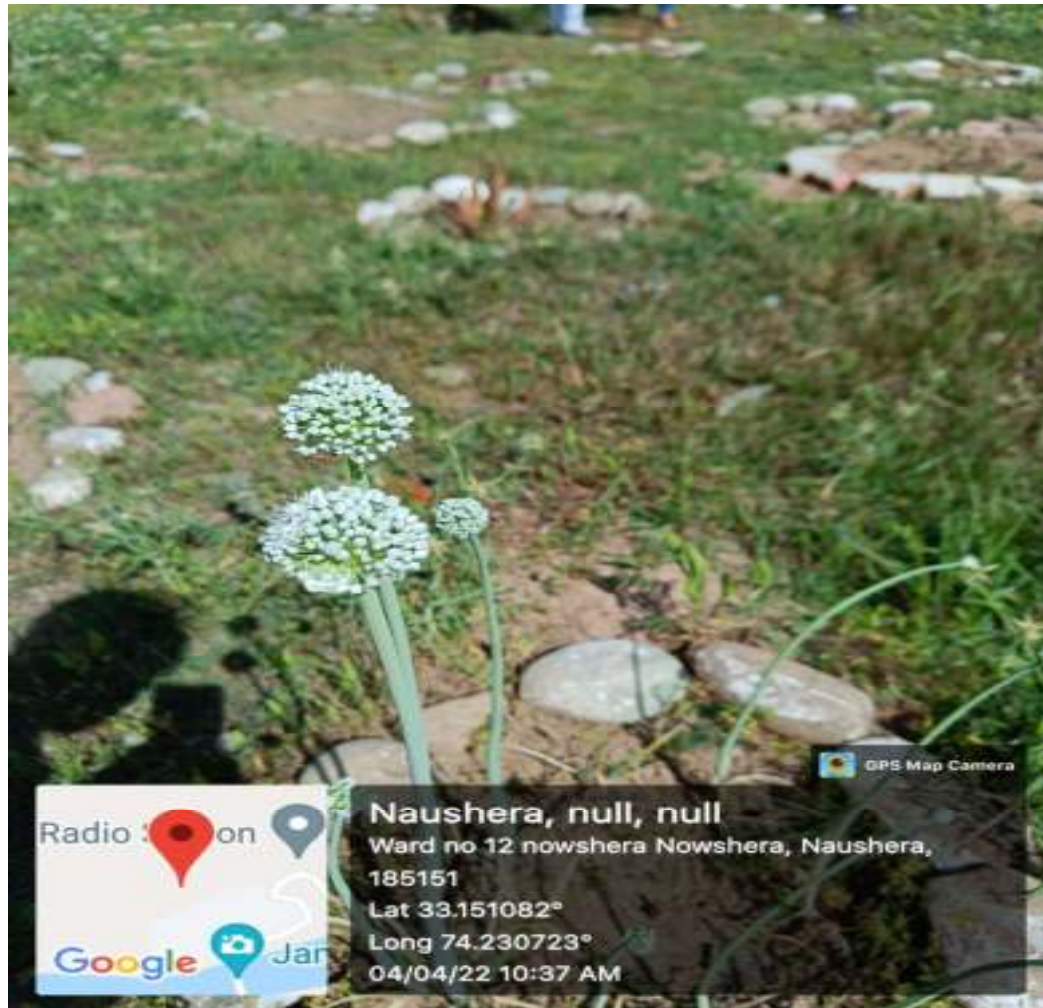
PLANTS GROWING IN HERBAL GARDEN











HERBARIUM

Herbarium is a repository of plants in dried and preserved form. A variety of Herbarium specimens belonging to local flora have been submitted by the students of Botany.

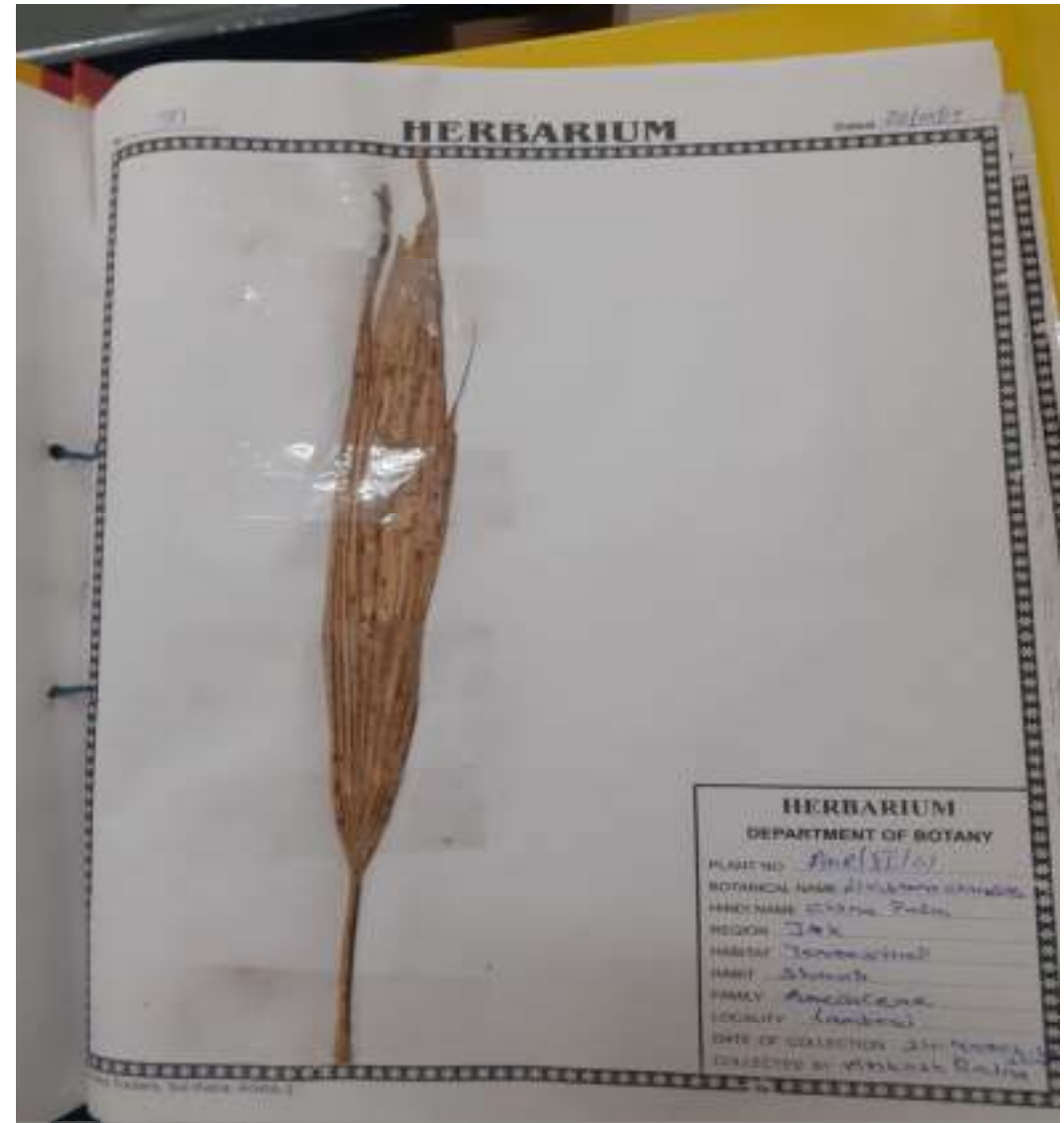
DEPARTMENT OF Botany
HERBARIUM

Voucher number / Accession number	Plant number / Collector's number	Name of the plant
01 dt. 10/04/19	ND/VI/Nov/01	<u>Rubus ellipticus</u>
02 dt. 10/04/19	VC/VI/Nov/01	<u>Pteris communis</u>
03 dt. 10/04/19	KC/VI/Nov/01	<u>Tournefortia ciliata</u>
04 dt. 15/04/19	HC/VI/Nov/01	<u>Justicia adhatode</u>
05 dt. 15/04/19	NCC/02/PA/01	<u>Erigeron pectinatus</u>
06 dt. 15/04/19	NICE/014/HC/01	<u>Rumex acetosa</u>
07 dt. 16/04/19	RISE/04/02/01	<u>Taraxacum officinale</u>
08 dt. 16/04/19	SH/VI/Nov/01	<u>Laminaria japonica</u>
09 dt. 18/04/19	AN/VI/Nov/01	<u>Lepidium latifolium</u>
10 dt. 18/04/19	NK/VI/Nov/01	<u>Fumaria parviflora</u>
11 dt. 18/04/19	NH/VI/Nov/01	<u>Crossandra indica</u>
12 dt. 02/05/19	JS/VI/Nov/01	<u>Commelina sativa</u>
13 dt. 02/05/19	JS/VI/Nov/02	<u>Tagetes erecta</u>
14 dt. 07/05/19	PD/VI/Nov/01	<u>Abies indica</u>
15 dt. 07/05/19	PD/VI/Nov/02	<u>Psidium guajava</u>

16 dt. 9/10/19	Md/Nar/VI/01
17 dt. 9/10/19	Md/Nar/VI/02
18 dt. 9/10/19	KD/Nar/VI/03
19 dt. 9/10/19	Sc/Nar/VI/01
20 dt. 9/10/19	Dc/Nar/VI/02
21 dt. 10/05/19	Ar/Nar/VI/01
22 dt. 10/05/19	Hc/VI/01
23 dt. 10/05/19	Md/VI/01
24 dt. 10/05/19	RK/VI/01
25 dt. 10/05/19	Ac/VI/01
26 dt. 12/15/19	Sb/VI/01
27 dt. 12/15/19	Nd/VI/01
28 dt. 12/15/19	KD/VI/01
29 dt. 12/15/19	S-15/VI/01
30 dt. 22/15/19	AR/VI/01
31 dt. 22/15/19	AnR/VI/01
32 dt. 22/15/19	Sc/VI/Nar/01
33 dt. 22/15/19	Pam/01/1000
34 dt. 22/10/19	Ch. Soria/Nar/VI/01

Ficus religiosa
Morus alba
Callistemon
Acacia modesta
Melic azadirachta
Jurubea albatoda
Jurubea albatoda
Balbergia sinu
Balbergia sinu
Eriobotrya japonica
Hibiscus rosa sinensis
Jurubea albatoda
Jurubea albatoda
Rosa indica
Cosmos sativa
Livistone chinensis
Taxus erecta
Dodonaea angustifolia
Acacia modesta





HERBARIUM

Subsidiary
by dated 1/10/17



HERBARIUM
DEPARTMENT OF BOTANY

PLANT NO. VC/VI/14/101
BOTANICAL NAME *Cassia communis*
HINDI NAME अण्डुल
REGION Punjab
HABITAT Land plant
HABIT Shrub
FAMILY Leguminosae
LOCALITY Near Lady for INSR
DATE OF COLLECTION 1-3-2017
COLLECTED BY Varun Choudhary

PROJECT WORK GIVEN TO STUDENTS

- To impart experiential learning, the students are assigned Project work under various courses.
- A summarized account of various Projects given to students of Botany is given below:

S. No.	PROJECT TITLE	COURSE TITLE/CODE
1.	Study the morphological diversity and taxonomy of the common plants belonging to the families mentioned in your syllabus (at least 10 plants)	Characteristics and systematics of seed plants /UBOPC 202
2.	Cultivation of Oyster mushroom (Dhingari)	Mushroom Cultivation Technology/UBOTS 503
3.	Prepare any two mushroom recipes	Mushroom Cultivation Technology/UBOTS 503
4.	Prepare a list of spices, timber-yielding plants and medicinal plants of your area (at least 10 plants of each category)	Economic Botany and Biotechnology/UBOPE 502

Program Outcomes, Program Specific Outcomes and Course Outcomes

NAME OF THE PROGRAM: - BACHELOR DEGREE PROGRAM (UG).

❖ PROGRAM OUTCOMES (POs)/PROGRAM SPECIFIC OUTCOMES (PSOs):

Upon successful completion of their graduation with Botany, students will be able to:

- Demonstrate the basic knowledge on the various aspects of plant life (morphological, anatomical, physiological, molecular, etc.).
- Practical skills in the field and laboratory experiments.
- Presentation skills (Oral & Writing) in Life Sciences.

- Apply the knowledge acquired in the classes to solve the problems using critical thinking and analytical reasoning.
- Develop the scientific attitude to become a good researcher in Plant Sciences.
- Effectively utilize the knowledge so acquired to prepare for the various competitive examinations for career development.
- Imbibe the moral and ethical values to lead a peaceful life in a world of multicultural competence.

COURSE OUTCOMES (COs)

SEMESTER-I

COURSE TITLE: - THE DIVERSITY OF MICROBES AND CRYPTOGAMS

COURSE CODE: - UBOTC 101 (THEORY)- 4 Credits; UBOPC 102 (PRACTICAL)- 2 Credits

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

- Illustrate the characters of micro-organisms (Viruses, Bacteria, Cyanobacteria, Mycoplasma) and their economic importance.
- Learn about the life histories of important algal genera and their economic importance.
- Know about life histories of important fungal genera and the economic importance of Fungi.
- Identify disease symptoms in host plants infected by fungi, viruses and mycoplasmas.

- Understand the morphology, anatomy, reproductive details and importance of Bryophytes and Pteridophytes.
- Understand the evolution of sporophyte and alternation of generation in bryophytes.
- Understand the heterospory, stellar system and alternation of generation in pteridophytes.

SEMESTER-II

COURSE TITLE: - Characteristics and Systematics of Seed Plants

COURSE CODE: - UBOTC 201 (THEORY)- 4 Credits; UBOPC 202 (PRACTICAL)- 2 Credits

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

- Learn about the fossilization process, types of fossils and few representatives of gymnosperm and angiosperm fossils.
- Know about the general characteristics and classification of gymnosperms and angiosperms.
- Compare the morphology, anatomy and reproductive details of important gymnosperms (Cycas, Ephedra and Pinus).

- Understand the origin of angiosperms; history of angiosperm taxonomy and various systems of angiosperm classification.
- Analyze the role of ICN, BSI and herbarium preparation techniques.
- Understand the principles and rules of Botanical Nomenclature; taxonomic ranks and principle of priority.
- Know about the contributions of anatomy, embryology, cytology and phytochemistry in the field of taxonomy.
- Learn about various angiosperm families and their economic importance.

SEMESTER-III

COURSE TITLE: - PLANT ANATOMY, EMBRYOLOGY AND ECOLOGY.

COURSE CODE:- UBOTC 301 (THEORY)- 4 Credits; UBOPC 302 (PRACTICAL)- 2 Credits

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

- Understand the concept, types and organization of meristems.
- Work out the anatomical details of monocot and dicot tissues.
- Illustrate the structure and derivatives of secondary meristems.
- Examine the structure and development of male and female reproductive parts of a flower.
- Understand the process of fertilization and post-fertilization events.
- Learn the seed formation and seed dispersal strategies.
- Know about atmosphere stratification and composition; greenhouse effect; climate change etc.
- Understand the concept of energy flow in the ecosystem, process and types of ecological succession; climax communities; growth curves; ecotypes and ecads.

SEMESTER-IV

COURSE TITLE: - PLANT PHYSIOLOGY AND METABOLISM

COURSE CODE: - UBOTC 401 (THEORY)- 4 Credits; UBOPC 402 (PRACTICAL)- 2 Credits

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

- Understand the mechanism of absorption of water, minerals, solute transport, transpiration etc.
- Spell out the water relations of plants and infers its relation to plant growth and function.
- Organize the photosystems and experiment with C₃, C₄ and CAM plants and identify their significant characters.
- Examine the mechanism of photosynthesis; light reaction; dark reaction; oxygen evolving complex etc.
- Understand the mechanism of respiration; ETC and synthesis of ATP.
- Know about the biological Nitrogen Fixation; concept, synthesis pathway and roles of secondary metabolites.

SEMESTER-V

COURSE TITLE: - CELL BIOLOGY AND GENETICS

COURSE CODE: - UBOTE 501 (THEORY)- 4 Credits; UBOPE 502 (PRACTICAL)- 2 Credits

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

- Understand the structure and functions of cell wall, plasma membrane and various cell organelles.
- Elucidate the structure of chromosomes; process of cell division; the structure and replication of DNA.
- Know the structure and function of extranuclear genomes; mitochondrial and plastid DNA and plasmids.
- Discuss the organization of DNA in prokaryotes and eukaryotes; concept of gene; genetic code; transcription and translation.
- Understand the types, effect and detection of various chromosomal alterations (numerical and structural).
- Work out the various types and sources of mutations; transposable elements; DNA damage and repair mechanisms.
- Explain Mendel's laws of inheritance and work out the allelic and non-allelic gene interactions.

SEMESTER-VI

COURSE TITLE: - ECONOMIC BOTANY AND BIOTECHNOLOGY

COURSE CODE: - UBOTE 601 (THEORY)- 4 Credits; UBOPE 602 (PRACTICAL)- 2 Credits

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

- Understand the origin of major food crops i.e. wheat, maize and rice and their cultivation patterns in India.
- Discuss the Botany, processing and utilization of fibers, non-alcoholic beverages and spices & condiments.
- Learn the cultivation and utilization of major oil crops, pulses, vegetables and fruits.
- Gain knowledge of medicinal plants, firewood and timber-yielding of J&K; sources and extraction of Rubber.
- Assess the cultivation and maintenance of indoor & outdoor ornamental plants.
- Understand the basic concepts of plant tissue culture; micropropagation; somatic embryogenesis etc.
- Learn the concept of biotechnology; recombinant DNA technology; gene cloning and c-DNA library.

FUTURE PLANS

- Botanical garden and herbal garden will be further expanded to add more plants especially the ones on the verge of extinction.
- Laboratory facilities will be enhanced so that students are able to conduct molecular level work.
- To conduct virtual lab tours so that students are well aware of the current research work going throughout the world.
- Field trips and botanical tours will be conducted more frequently to enhance the knowledge of students.
- Mushroom cultivation will be expanded to develop enthusiasm among students regarding self-employment.

CONTINUED

- Invited lectures and talks will be held from eminent faculties and scholars from other institutions.
- NEP will be implemented with special emphasis on skill based courses such as Mushroom Cultivation; Nursery, Gardening and Floriculture.