Courses offered/covered at U.G. level
Department of BSH, CoF, NAU, Navsari

Course Number	Title of Course	Credits
BSH 1.1	Information & Communication Technology	1+1
BSH 1.2	Introductory Botany	1+1*
BSH 1.3	Communication Skills and Personality Development	1+1
BSH 1.4	Plant Physiology	2+1
BSH 2.7	Statistical Methods and Experimental Techniques	2+1
BSH 2.8	Principles of Plant Cytology and Genetics	2+1
BSH 6.9	Entrepreneurship Development and Business Management	1+1
BSH 8.10	Forest Tribology and Anthropology	2+0
BSH 8.11	Agricultural Informatics	1+1

Facilities Available:

i) Compound and binocular microscopes, Physiological apparatus for demonstration of transpiration, respiration, photosynthesis viz – types of potometer, respirometer, clinostat (vertical and horizontal for demonstration of growth), leaf area meter, dendrometer and photosynthetic apparatus.

ii) Well equipped Forest Biotechnology Laboratory having the State of Art facilities for Molecular Biotechnology related research.

iii) Permanent slides of plant tissues, cell divisions and charts for morphological studies of various flowering plant families as also of root, stem and leaves including collection of preserved specimens of Algae, Fungi and other plant groups.

iv) 4 ha Model Nursery on Medicinal and Aromatic Plants for identification, multiplication and collection of medicinal and aromatic germplasm.

v) Biodiversity Conservation Centre for students and researchers – collection of unique flora of Gujarat and India.

vi) Collection of over 300 dried herbarium specimens.

Research Activities:

I) Completed Projects and Experiments:

No.	Title of Project	Name of PI	Funding Agency
1.	Reproductive Biology and Phenological studies of Tropical Tree species – Sterculia urens, Tectona Grandis and Terminalia arjuna	Dr. Bimal S Desai	Gujarat Council On Science & Technology (GUJCOST) Gandhinagar
2.	Forest Resource Survey of Rajpipla Forest Division	Dr. Bimal S Desai	Gujarat Forest Research Institute (GFRI), Gandhinagar
3.	Induced resistance in Eucalyptus seedling against Gall insect	Dr. Kirti Bardhan	Departmental Research
4.	In vitro regeneration of Eucalyptus (*Eucalyptus tereticornis*)	Dr. Vipulkumar Patel	Departmental Research
5.	*In vitro* growth of callus from normal & gall infected *Eucalyptus* tissue	Dr. Kirti Bardhan	Departmental Research

B. Ongoing Project & Departmental Experiments:

No.	Title of Project	Name of PI	Funding Agency
1.	Exploration and evaluations of mangrove diversity along coastal belt of South Gujarat	Dr. Vipulkumar Patel	Departmental Research
2.	Metagenomic analysis of flooded rice ecosystem under climate change resilience.	Dr. Vipulkumar Patel	Departmental Research
3.	DNA barcoding of different Bamboo and Ficus species	Dr. Vipulkumar Patel	Departmental Research
4.	Exploration of molecular tools for identification of potential DNA barcodes and biomarkers for Red Sanders (Pterocarpus santalinus L. f.) authentication.	Dr. Vipulkumar Patel	Departmental Research
5.	Transcriptome profiling of wild rice [Oryza coarctata (Roxb.)] under different salt regimes	Dr. Vipulkumar Patel	Departmental Research
6.	Genetic enhancement of niche corps of South Gujarat through conventional and biotechnology approach.	Dr. Vipulkumar Patel	Plan Research Project, GoG.
7.	Integrative centre for translational research to explore the worth of plant genetic resources of South Gujarat	Dr. Vipulkumar Patel	Plan Research Project, GoG.
8.	Quantitative and Cross Cultural Ethnobotanical Studies of plants used by Kukna tribe of South Gujarat.	Dr. Bimal S Desai	Departmental Research
9.	Documentation and Quantitative analysis of plants used for Oral Health Care by local inhabitants of Dharampur and Dangs Forests.	Dr. Bimal S Desai	Departmental Research

Research Papers in Journals

1. Pilo B, **Desai B. S.**, Manoj E and Dave M. (2005). "Conservation Status of *Citrullus colocynthis* in Gujarat". *Ecology, Environment and Conservation*. **8** (**1**): pp. 105-110.
2. Jasrai, Y. T., Wala, B and **B. S. Desai**. (1999). "Computer Based Complementary Technique for Plant Herbaria". *Current Science*. Vol. 75. Page 695.
3. Gorfad, K., **Desai, B. S.**, Jha, S. S., Patel, D. P., Prajapati, V. M., & Garde, Y. A. (2022). Influence of different hormones and potting media on growth and quality of Chitrak [*Plumbago zeylanica* L.]. *Pharma Innov. J*,**11** (11): 2389-2394
4. Chandel, S., Desai, B. S., Jha, S. K., Sinha, S. K., Patel, D. P., & Kumar, N. (2024). Role of organic and inorganic fertilizers in enhancing biomass yield and eugenol content of ornamental basil (Ocimum gratissimum L.). *Heliyon*, 10 (10).
5. Patel, M. H., Desai, B., Jha, S., Patel, D., Mehta, A., & Garde, Y. (2023). Phytochemical, pharmacognosy and ethnobotanical importance of the Ficus virens Aiton. *Pharma Innov. J*, 12, 4017-4021.
6. Malek, S. S., Patel, M. H., Rathod, K. R., Jha, S. K., **Desai, B. S., and** Tandel, M. B. (2024). Phyto-sociological changes in the Goima Forest, Gujarat due to human disturbances and their implications for conservation. *Journal of Environmental Biology*, 45(5), 565-575.
7. Mayur, L. R., Desai, B. S., Jha, S. S., Patel, D. P., & Hegde, H. T. (2022). Effect of different seed treatments and media on growth and biomass of Indian cheese maker-Withania coagulans (stocks) dunal. *International Journal of Economic Plants*, 9(1), 6-10.
8. Senjaliya, H., Gajjar, P., Dodia, V., Shah, P., **Bardhan, K., and** Shukla, M. (2023, May). A Comparative Study on the Modern Deep Learning Architectures For Predicting Nutritional Deficiency in Rice Plants. In 2023 IEEE IAS Global Conference on Emerging Technologies (GlobConET) (pp. 1-6). IEEE.

9. Thakre H.S., **Kirti Bardhan** and Kumar V. (2011) : Effect of square removal on growth, yield and fiber quality of transgenic Bt Cotton hybrids: *Indian Journal of Plant Physiology:* Vol. 16 No. 2(N.S.) pp 200-204
10. M.K.Yadav, Patel N.L., Patel S.R. and **Kirti Bardhan** (2009): Response of banana (Musa paradisiacal L.) cv. Grand Nine to micronutrient: *Annals of Plant Physiology:* vol.23, No.1 pp 71-73, Published by : Sabaragamuwa University of Srilanka.
11. M.K.Yadav, Singh P.S, Patel N.L. and **Kirti Bardhan** (2006):Response of GA_3, $Ca(NO_3)$, bavistin and neem extract on the storage life of Nagpur mandarin (Citrus reticulate Blanco): *Indian Journal of Arid Horticulture:* Vol.1, No.1 pp-80-82
12. Patel, C. S.; Jani, J. J., **Parekh, V. B**., Darji, V. B. and Vaishnav, P. R. (2009). Geographic variations and their impact on bioefficacy amongst *Helicoverpa armigera* Nuclear polyhedrosis Virus isolates from India. *World J. Microbiol. Biotechnol.*, 26(5): 783-794 (DOI 10.1007/s11274-009-0234-9)
13. Jadhav, P., Mahatma, M.K, Mahatma, L., Jha, S.,**Parekh, V.B** and Khandelwal, V. (2013) Expression analysis of key genes of phenylpropanoid pathway andphenol profiling during Ricinus communis–*Fusarium oxysporum* f. sp.ricini interaction. *Industrial Crops and Products* 50 (2013) 456– 461.
14. Mhaske S.D, Mahatma M.K, Jha, S., Singh, P., Mahatma, L., **Parekh V.B** and Ahmad, T. (2013). Castor (*Ricinus communis* L.) Rc-LOX5 plays important role in wilt resistance. *Industrial Crops and Products*, 45 (2013) 20– 24
15. Jain, R., Jha, S., Adhikary H., Kumar, P., **Parekh, V.B,** Jha A., Mahatma, M.K. and Kumar, N. (2014) Isolation and Molecular Characterization of *Arsenite-Tolerant* Alishewanella sp. GIDC-5 Originated from Industrial Effluents, *Geomicrobiology Journal*, 31:1, 82-90, DOI: 10.1080/01490451.2013.811317
16. Patil, V. R., Talati, J. G., Singh, C., **Parekh,V. B**. and Jadeja, G. C. (2015): Genetic Variation in Glutenin Protein Composition of Aestivum and Durum Wheat Cultivars and Its Relationship with Dough Quality, *International Journal of Food Properties*, DOI: 10.1080/10942912.2014.980948

16. Ayer, D.K., Modha, K., **Parekh, V.** *et al.* (2020) Associating gene expressions with curcuminoid biosynthesis in turmeric. *Journal of Genetic Engineering and Biotechnology* 18, 83 https://doi.org/10.1186/s43141-020-00101-2.

17. Kaldate S, Patel A, Modha K, **Parekh V**, Kale B, Vadodariya G, Patel R. (2021) Allelic characterization and protein structure analysis reveals the involvement of splice site mutation for growth habit differences in *Lablab purpureus* (L.) Sweet. *Journal of Genetic Engineering and Biotechnology*. 19(1):34. doi: 10.1186/s43141-021-00136-z.

18. Patel, Dipika S; Kirti, Bardhan, Dhiraji, P. Patel, **Vipulkumar Parekh**, Suchismita, Jena, Ajay, V. Narwade, Harshadkumar, N. Chhatrola (2021) Does plant root architecture respond to potassium under water stress? A case from rice seedling root responses. Current Science (00113891) . 3/25/2021, Vol. 120 Issue 6, p1050-1056. 7p.

19. Bardhan K, York LM, Hasanuzzaman M, **Parekh V,** Jena S, Pandya MN. (2021) Can smart nutrient applications optimize the plant's hidden half to improve drought resistance? *Physiologia Plantarum Jun*;172(2):1007-1015. doi: 10.1111/ppl.13332. Epub 2021 Jan 20. PMID: 33432608

20. Patel, S., **Parekh, V**., Patel, K. *et al.* (2021). Plant Growth-promoting Activities of Penicillium sp. NAUSF2 Ameliorate Vigna radiata Salinity Stress in Phosphate-deficient Saline Soil Applied Biochemistry and Microbiology 57, 500–507 https://doi.org/10.1134/S000368382104013X

21. Chaitanya S. Mogal, Vanrajsinh H. Solanki, Rohan V. Kansara, Sanjay Jha, Susheel Singh, **Vipulkumar Parekh**, B.K. Rajkumar (2022) UHPLC-MS/MS and QRT-PCR profiling of PGP agents and Rhizobium spp. of induced phytohormones for growth promotion in mungbean (var. Co4), Heliyon, 8 (5), e09532, https://doi.org/10.1016/j.heliyon.2022.e09532.

22. Krishna, S., Modha, K., **Parekh, V.** *et al*. (2022) Phylogenetic analysis of phytochrome A gene from Lablab purpureus (L.) Sweet. Journal of Genetic Engineering and Biotechnology. https://doi.org/10.1186/s43141-021-00295-z

23. Mendapara, I.; Modha, K.;Patel, S.; **Parekh, V**.; Patel, R.;Chauhan, D.; Bardhan, K.; Siddiqui,M.H.; Alamri, S.; Rahman, M.A. Characterization of CcTFL1 Governing Plant Architecture in Pigeon pea (*Cajanus cajan (*L.) Millsp.).Plants (2023), 12, 2168. https://doi.org/10.3390/plants12112168

24. Pratik Satasiya, Sanyam Patel, Ritesh Patel, Om Prakash, Kaushal Modha, Vipul Parekh, Haimil Joshi, **Vipul Patel,** Ankit Chaudhary, Deepak Sharma and Maulik Prajapati. (2024). Meta-analysis of identified genomic regions and candidate genes underlying salinity tolerance in rice (*Oryza sativa* L.) *Scientific Reports*, 14: 5730

25. V. Srivashtava, S. Jha, and **V. Parekh** (2019) Overexpression of LmgshF from *Listeria monocytogenes* in Indica Rice Confers Salt Stress Tolerance, *Russian Journal of Plant Physiology* doi: 10.1134/S1021443719060116

Review Articles Published in Edited Books

1. Jasrai, Y. T and **B. S. Desai**. (2002). "Herbal Resources available for commonest disease – Diabetes". In: Role of Biotechnology in Medicinal Plants – VIII. Ukaaz Publications. Hyderabad. Edited by Irfan Ali Khan & Atiya Khanum.
2. **Desai, B. S**., Pradeepkumar, G and G. Prathapasenan (2003). "Biodiversity of Gujarat with Special Reference to Protected Areas-Problems and Perspectives". In: Protected Habitats and Biodiversity. Published by NATCON, Muzzarfarnagar.
3. **Desai, B. S**., Desai, R. B. and Y. T. Jasrai (2005). "Herbal Therapy for Rheumatoid Arthritis". In: Herbal Medicines for Human Diseases. Vol. 2. Ukaaz Publications. Hyderabad. 2005. Edited by Irfan Ali Khan & Atiya Khanum.
4. Ram, M. L., **Desai, B. S**., and Jha, S. S. (2023). Indian Cheese Revolution: *Withania coagulans* in Dairy Industry. In Recent Trends on Cheese as Functional Food with Great Nutritive and Health Benefits, Published by Intechopen, London, U.K

Books/Booklets Published

1. Jasrai, Y. T., PradeepKumar, G. and **B. S. Desai**. (2001). "Medicinal Plants – I". Published by University Press. M. S. University of Baroda. Vadodara (Book)
2. Jasrai, Y. T., Sisodia, P and **B. S. Desai**. (2005). "Plants – Importance, Diversity and Conservation". Published by Botanical Garden and B. Sc. Environmental Science Programme. M. S. University of Baroda, Vadodara (Booklet)
3. **Desai, B. S**., Jasrai, Y. T., Parabia, F. M and M. H. Parabia (2008). "Medicinal Plants and Glossary of Selected Terms". Published by Bharatiya Kala Prakashan.Delhi. (Book)
4. **Vipul Parekh, Jadeja G.C., Subhash N.** (2011) Molecular Marker Polymorphism and Hybrid Performance: A study on Pearl millet [Pennisetum glaucum (L.) R Br. emend. stuntz] for yield and drought resistance traits. LAP LAMBERT Academic Publishing GmbH & Co. KG. Germany. ISBN No. 978-3-8473-1618-3.

Papers Presented in Seminars/Symposiums

1. V. Kumar and **Kirti Bardhan** (2009): Screening of cotton genotypes for moisture stress using drought stress indices: National Conference on frontiers in Plant Physiology towards Sustainable Agriculture. 5-7 Nov., 2009 held at AAU, Jorhat, Assam.pp-42
2. H.S. Thakre, V.Kumar and **Kirti Bardhan** (2009): Effect of square removal on cotton growth, yield and fiber quality: National Conference on frontiers in Plant Physiology towards Sustainable Agriculture. 5-7 Nov., 2009 held at AAU, Jorhat, Assam.pp-109
3. **Kirti Bardhan**, V.Kumar, Tashlim Ahmed, Patel D.H. and Shah R.R. (2008): Establishment of tissue cultures of elite parental lines of cotton: Golden Jubilee Conference on "Challenges and Emerging Strategies for Improving Plant Productivity".12-14 Nov.2008 held at IARI, New Delhi pp.206
4. V.Kumar and **Kirti Bardhan** (2008): Physiological variation in Bt cotton hybrids. Golden Jubilee Conference on "Challenges and Emerging Strategies for Improving Plant Productivity".12-14 Nov.2008 held at IARI, New Delhi pp.170
5. **Kirti Bardhan** and V.Kumar (2007): An evaluation of the potentiality of exogenous osmoprotectants mitigating water stress on chickpea: International Conference on Sustainable Agriculture for Food, Bio-energy and Livelihood Security.14-16 Feb.2007 held at J.N.K.V.V. Jabalpur, M.P.
6. **Kirti Bardhan**, Kumar V. and Vashi P.S.(2005): Evaluation of the potentiality of exogenous osmoprotectants on the growth and yield of chickpea under unirrigated condition. National Seminar on Plant Physiology (Crop productivity and quality improvement through physiological interventions). 23-25 Nov, 2005 held at NAU, Navsari(Guj.)pp-13
7. **Kirti Bardhan** and Kumar V.(2005): Alleviation of water stress by foliar application of osmoprotectants in chickpea. National Seminar on Plant Physiology (Crop productivity and quality improvement through physiological interventions). 23-25Nov, 2005 held at NAU, Navsari (Guj.)pp-62

8. Oral paper presentation entitled”Genetic diversity Diversity analysis of CMS and Restorer lines of Pear millet (*Pennisetum glaucum(L.)* Br. emend. stuntz) using RAPD and Microsatellite Markers" at the National Conference on "Frontiers in Biological Sciences", S.P. University, Vallabh Vidyanagar, Gujarat, India. (Won 2nd prize)
9. “Genomic Characterization of geographic isolates of Nuclear Polyhedrosis Virus against Helicoverpa armigera (Hubner) (Lepidoptera: Noctuidae).” C.S. Patel, **V.B. Parekh** and J. J. Jani National Seminar on Emerging areas in Plant Sciences, sponsored by CSIR, New Delhi, Department of Botany, M. S. University, Vadodara
10. “Forest Biotechnology: Present status and future perspectives.” National Seminar on Agroforestry: An evergreen agriculture for food security and environmental resilience. 2-4th February, 2012 organized by Aspee College of Horticulture and Forestry, Horticultural society of Gujarat, Gujarat Association of Agricultural Sciences, Navsari.

Major Achievements:

- 02 students got Scholar ship and minor project of Rs. 25000 from GUJCOST, Gandhinagar under Student Sci-Tech Programme (**Dr. Bimal S. Desai**)
- 13 students completed M. Sc. and 01 student completed Ph.D and 03 are pursuing their Doctorate in Medicinal and Aromatic Plants (FPU) (**Dr. Bimal S. Desai**)
- Guided nearly 80 farmers on cultivation and processing of Medicinal and Aromatic Plants.
- 04 students completed and 03 students are pursuing their M.Sc. in Plant Molecular Biology and Biotechnology (**Dr. Vipulkumar Patel**)
- **DR. KIRTI VARDHAN** is the recipient of the following awards and honors:
- Recipient of **Best Poster Presentation Award** from Indian Society for Plant Physiology for poster presentation during National Seminar based on M.Sc. Research.
- Selected for **University P.G. Fellowship** from Agricultural Faculty for Ph.D. Studies by Navsari Agricultural University, Navsari (Gujarat)
- **Recipient of Second Prize during Inter-college paper presentation competition of Navsari Agricultural University, Navsari (Gujarat)**
- **ACHIEVEMENTS OF DR. VIPULKUMAR PATEL:**
- Won **Second price in oral presentation** on “Diversity analysis of CMS and Restorer line in pearl millet using RAPD and Microsatellite markers” at National seminar on frontier in biological sciences. BRD school of Biosciences, SPU, V.V.Nagar, Gujarat.
- **Got selected and Trained at International training on Genome Editing Technology (CRISPR/Cas technology)** at The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), October, 2019.
- Organized a **short-term training program in collaboration with Gujarat Biotechnology Research Centre (GBRC), (Government Of Gujarat) Gandhinagar**, under ages of "KAUSHALYA" (Knowledge Advancement Using Skills on High-end Applied LifetechnologY for Aspirants), Gujarat State Biotechnology Mission (GSBTM) GBRC on “Basic Molecular Biology Techniques” during 10th to 14th April, 2023 at Forest Biotechnology Laboratory, College of Forestry, NAU, Navsari.
- **Conferred “Best Oral Presentation award”** at Progressive Horticulture Summit-2024. Organized by the Indian society for Horticulture research and Development, Uttarakhand and ASPEE College of Horticulture, NAU, Navsari, January -18-20, 2024.