

CENTRE OF GENOMICS AND BIOINFORMATICS



DEEN DAYAL UPADHYAYA GORAKHPUR UNIVERSITY GORAKHPUR-273009, UTTAR PRADESH

Information Brochure 2022-23



ABOUT THE UNIVERSITY

Deen Dayal Upadhyaya Gorakhpur University, established in 1957 by the Uttar Pradesh State Universities Act, in its long eventful journey has constantly striven to live up to its motto, "□ □□ 00000 00000 00000 00000 " (Let noble thoughts come to me from all directions) by assimilating diverse ideas, people and beliefs into its academic life. The geographical location of University is 26.7480 degrees North (latitude), 83.3812 degrees East (longitude). The first University established in Uttar Pradesh after Independence and named after the great political thinker, Pandit Deen Dayal Upadhyaya is located in the holy city of Gorakhpur and inherits the spiritual and philosophical legacy of Buddha, Kabir and Guru Gorakshnath. Spread over 191.21 acres, it houses 06 faculties comprising of 29 departments that have been playing a significant role in imparting holistic education to the people of the Eastern region since its inception. As a residential-cumaffiliating State University it can boast of a rich academic legacy, illustrious alumni, experienced, and dedicated qualified faculty members, effective transparent, and responsive administrative set up, state-of-the art library, Wi-Fi campus, ample career growth opportunities for its students, advanced research facilities and a vibrant and safe campus. With its cherished goal of nourishing creative talent and scientific temper among its students and sensitizing them to larger socio-economic and political realities, University aspires to contribute meaningfully to regional and national development.

VISION

- 1. To provide the students with an academically congenial and safe environment, conducive to their holistic development.
- To achieve and ensure intellectual excellence through effective teaching, latest research and relevant co-curricular activities.
- 3. To equip the student with academic and professional skills, ethical values and leadership qualities to enable them to contribute towards social, regional and national development
- 4. To sensitize the University fraternity to the needs of the region through knowledge-transfer and outreach programmes
- 5. To strive towards the optimum use of available resources in making the campus sustainable, clean, green and eco-friendly.
- 6. To promote the principles of social, cultural and religious co-existence among the students, faculty members, administrative officers and ministerial staff of the University

BACKGROUND

The term "omics" refers to the field of study in biology ending in -omics. Omics term is used with suffix-ome to address the study of respective field in totality like genomics for genome, proteomics for proteome, metabolomics for metabolome and many more. Genomics is a of science associated comprehensive study of genome of an organism. The innovations in sequencing technologies in the recent years have led to the sequencing of several genomes giving substantial importance to the genomics for better understanding of processes. The sate-ofthe art genomic direct technologies have intervention agriculture. health environment and substantial efforts are being made to use these health and sustainable environment. With the technological advancement of sequencing technologies for crop improvement, better human in the recent years several microbial, plants, animals and human genomes have been sequenced. The exponential increase in the sequencing data led to the emergence of appropriate databases for storage, retrieval and analysis by scientists from different disciplines throughout the world. In the era of science of "omics" the relevance of the bioinformatics is being several tools, software and databases are being developed for supporting biological research in general.

CENTRE OF GENOMICS AND BIOINFORMATICS: GENESIS

To promote multidisciplinary approach in National Education Policy 2020, Deen Dayal Upadhyay Gorakhpur University initiated this centre emphasizing on three core academic functions i) research and innovation; ii) learning, teaching and outreach programs and iii) research collaborations at national and international level. The relevance of emerging state-of-the art technologies of genomics and bioinformatics for addressing problems related with agriculture, health, industry, environment and forensic is established globally. A proposal for the establishment of Centre for genomics and bioinformatics was initiated from Department of Biotechnology and was later on passed by all academic bodies of the University i.e. Faculty of Sciences (dated 21/11/2020), Academic Council (dated 26/11/2020) and Executive Council (dated 27/11/2020).

VISION

To be an important catalyst for the growth of Genomics, Bioinformatics, Agriculture, Biotechnology and related industries in Uttar Pradesh and India

MISSION

To grow into world class Centre for Genomics and Bioinformatics through its education, research and entrepreneurship programmes

VICE- CHANCELLOR'S MESSAGE



Prof. Rajesh Singh Hon'ble Vice Chancellor

The advancements in Next Generation Sequencing technologies and the ability to analyze large amounts of data are bound to have a dramatic impact on almost all domains of life, including healthcare, agriculture, food security, environment, forensic and so on. It is necessary to initiate India-relevant. collaborative research programmes to translate the benefits of this emerging area. Further, the global demand for well-trained professionals in genomics and big data analysis necessitates intensive training and educational programmes in this area to create adequate manpower and opportunities. employment Therefore, Centre of Genomics and Bioinformatics, was established at Deen Dayal Upadhyay Gorakhpur University and has launched research and training programme genomics and bioinformatics. The centre is also involved in running academic courses like M.Sc. Bioinformatics, M.Sc. Plant Biotechnology, under and postgraduate courses in Agricultural Sciences. The centre has long term vision and mission to guide its activities. Its interdisciplinary faculties plays a crucial role in enabling the centre to achieve its goal

OBJECTIVE/TASK OF CENTRE

☐ To develop state-of—the art lab facilities in Genomics and Bioinformatics □ To identify the research problems in agriculture, human health and environment genomics bioinformatics and intervention is needed □ To conduct functional genomics sequenced crops prevalent in this region to identify the potential genetic resources for crop improvement. To assist plant breeders to develop potential molecular markers for specific traits □ To decipher the microbial diversity of soil of this region with immense potential for producing industrially important enzymes/metabolites both using conventional and metagenomics approach To develop cost effective diagnostic tools for viral, bacterial and other diseases prevalent in this region ☐ To assist in DNA sequence analysis for forensic purpose ☐ To provide support in analysis of single nucleotide polymorphism in various diseases ☐ To develop tools and software for analysis of

genomics data related to cancer and other

☐ To conduct conformational studies of

peptides using ab-intio quantum mechanics based approaches; Homology modeling,

functional characterization of proteins;

Sequence based phylogenetic clustering and

structure prediction and Toxicology

chronic diseases

PROPOSED THEMATIC RESEARCH AREAS

GENOMICS

- ☐ Whole genome sequencing of crop / microbes relevant to this region
- ☐ Sequencing of metagenomes for deciphering novel sources of industrially important enzymes and also novel agriculturally important unculturable microbes
- ☐ Molecular identification of industrially important microbes to study their biodiversity in poorvanchal region
- ☐ Genomic intervention in the study of mechanism of action of anticancer molecules
- ☐ Genomic interventions in biodiversity study of agriculturally and medicinally important endophytes
- ☐ Genomic intervention in biofortification of crops (wheat) for Zinc and Iron
- ☐ Genomic intervention for developing biotic and abiotic stress tolerant crops relevant to this region
- ☐ Genomic intervention in mettalloprotein study of arsenic in plants
- ☐ To study the host genetic susceptibility patterns for viral and bacterial infection in Eastern Uttar Pradesh
- ☐ Identification of risk factors and susceptible genes involved in pathogenesis of diseases common in poorvanchal region.

BIOINFORMATICS

| Genome annotation and Genome-wide identification of transcription factors/genes/alleles for biotic and abiotic stress tolerance using available genome sequences |
|--|
| Bioinformatics based drug designing and development of inhibitors to combat infectious diseases |
| Design effective drugs against, Dengue virus, Zika virus, Triple Negative Breast Cancer, G4-quadruplex inhibitors of mycobacterium tuberculosis, ion channels for neurodegenerative diseases, DNA intercalator/ groove binders, DNA junctions, and liquid crystals |
| Interaction study of biologically active molecules with nanoclusters, leading to nano drug delivery systems |
| Use Ordinary Differential Equations (ODE) based approaches with the law of mass action to formulate the intracellular pathways and to elucidate the complex behavior of biological system |
| To develop mathematical model for disease trend prediction in Eastern Uttar Pradesh |
| To develop statistical and mathematical model for system biology approach in biological sciences |
| To prepare database of medicinal plant prevalent in this area for development of effective ayurvedic medicine |

PROGRAMMES TO BE OFFERED

Two namely M.Sc. new programmes Bioinformatics and M.Sc. Plant Biotechnology initiated from BOS Department Biotechnology DDU Gorakhpur University, Gorakhpur has been passed through faculty of Sciences, Academic council and Executive council of the University. Further, two PhD and four postdoctoral positions are sanctioned for research and tranining

MASTERS IN BIOINFORMATICS

M.Sc. Bioinformatics is a Masters course which specializes in the science of collecting and analysing complex biological data such as genetic information. Bioinformatics is a discipline at the interface between and statistics and is used in computing, organismal biology, molecular biology and biomedicine. The program provides hands-on expertise in the essential multi-disciplinary fields DNA sequencing, comparative of genomics, genome annotation, analysis of mutations in cancer, analysis of the cellular organization, the discovery of new drugs and vaccines, molecular interaction networks, that comprise the core of Bioinformatics.

MASTERS IN PLANT BIOTECHNOLOGY

M.Sc. Plant Biotechnology course takes forward postgraduate learning to enhance student's knowledge and achieve expertise in the area of specialization. The program aims to build expertise of the students in the niche areas of Plant Biotechnology. The syllabus specialized subjects offers such Biotechnology, Molecular Biology, Cell Biology, Plant Tissue Culture, Molecular Breeding, Genomics & Proteomics. Microbiology, **Bioinformatics** and Environmental Biotechnology.

MASTER OF SCIENCE (BIOINFORMATICS)

| Core Course | t | | Paper Name | Credit | | |
|--|--------------|--|--|--------|---------|--|
| Bi-502 Bi-503 Basic Bioinformatics 2+1 | | Core Course | | | | |
| Bi-502 | Semester – 1 | BI-501 | Molecular Biology | 2+1 | | |
| Optional Course (Only One) Bi-510 Problem Solving Through C 2+1 Bi-510 Problem Solving Through C 2+1 Bi-510 Bi-510 Structural Biology 3 3 3 3 3 3 3 3 3 | | | | | | |
| Bi-510 | | | | 2+1 | | |
| Ability Enhancement Compulsory Courses (AECC)AECC1 BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and lits conservation Core Course BI-504 Introduction JAVA Programming 2+1 Optional Course (only one) BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 BI-533 Introduction R Programming 3 Ability Enhancement Courses (AECC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer 3 production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 3 Minor Course (only one) BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-525 Bi-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 Minor Course (Only one) BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar Optimization 3 Total Credits 18 | | | | | | |
| Ability Enhancement Compulsory Courses (AECC)AECC1 BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and lits conservation Its conservation Its conservation Core Course BI-504 Introduction JAVA Programming 2+1 Optional Course (only one) BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 BI-533 Introduction R Programming 3 Ability Enhancement Courses (AECC): Skill enhancement course BI-540 BI-540 BI-550 Database Management 2+1 BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optional Course (only one) BI-514 Core Course BI-515 BI-506 Database Management 2+1 BI-507 Perl programming for Bioinformatics 2+1 BI-515 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 BI-515 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-525 BI-526 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 BI-527 NGS data Analysis 2+1 Compulsory Course BI-527 NGS data Analysis Course Seminar O+1 | | BI-510 | Problem Solving Through C | 2+1 | Total (| |
| Ability Enhancement Compulsory Courses (AECC)AECC1 BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and lits conservation Its conservation Its conservation Core Course BI-504 Introduction JAVA Programming 2+1 Optional Course (only one) BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 BI-533 Introduction R Programming 3 Ability Enhancement Courses (AECC): Skill enhancement course BI-540 BI-540 BI-550 Database Management 2+1 BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optional Course (only one) BI-514 Core Course BI-515 BI-506 Database Management 2+1 BI-507 Perl programming for Bioinformatics 2+1 BI-515 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 BI-515 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-525 BI-526 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 BI-527 NGS data Analysis 2+1 Compulsory Course BI-527 NGS data Analysis Course Seminar O+1 | | BI-511 | Structural Biology | 3 | | |
| Ability Enhancement Compulsory Courses (AECC)AECC1 BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and its conservation Core Course BI-504 Introduction JAVA Programming 2+1 | | Minor Course (Only one) | | | | |
| Ability Enhancement Compulsory Courses (AECC)AECC1 BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and its conservation Core Course BI-504 Introduction JAVA Programming 2+1 | | BI-520 | Cell Biology | 2+1 | dits 18 | |
| BI-530 Environmental Sustainability/Swachh Bharat Abhiyan activities/Biodiversity and lits conservation Core Course | | BI-521 | Biochemistry | 2+1 | | |
| Bharat Abhiyan activities/Biodiversity and its conservation | | Ability Enhancement Compulsory Courses (AECC)AECC1 | | | | |
| Total Core Core | | BI-530 | · · | 3 | | |
| Core Course Bi-504 | | | , | | | |
| Bi-504 Introduction JAVA Programming 2+1 | | | its conservation | | | |
| BI-505 Introduction to Genomics and Proteomics 2+1 Optional Course (only one) BI-512 Probability and Information theory 3 BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 Biomathematics and Biostatistics 2+1 BI-523 Introduction R Programming 3 Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 2+1 2+1 2+1 2+1 3+1 3+1 3+1 3+1 3+1 3+1 3+1 3+1 3+1 3 | | | | | | |
| Optional Course (only one) BI-512 Probability and Information theory 3 BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 Biomathematics and Biostatistics 2+1 BI-523 Introduction R Programming 3 Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NoS data Analysis 2+1 BI-527 NoS data Analysis 2+1 BI-520 Course Seminar 0+1 | | | | | | |
| BI-512 Probability and Information theory 3 BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 Biomathematics and Biostatistics 2+1 BI-523 Introduction R Programming 3 Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | BI-505 | Introduction to Genomics and Proteomics | 2+1 | | |
| BI-513 Data structure and algorithms 3 Minor Course (only one) BI-522 Biomathematics and Biostatistics 2+1 BI-523 Introduction R Programming 3 Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-526 Human Values and professional Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | | | | |
| Ability Enhancement Courses (AEC): Skill enhancement course BI-540 | ۵. | BI-512 | Probability and Information theory | 3 | T | |
| Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC) AECC2 BI-531 Human Values and professional athics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | r – 2 | BI-513 | Data structure and algorithms | 3 | otal | |
| Ability Enhancement Courses (AEC): Skill enhancement course BI-540 | ster | | | | | |
| Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC) AECC2 BI-531 Human Values and professional athics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | me | BI-522 | Biomathematics and Biostatistics | 2+1 | dit | |
| Ability Enhancement Courses (AEC): Skill enhancement course BI-540 Mushroom Culture/Bio-fertilizer production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 Ability Enhancement Compulsory Courses (AECC) AECC2 BI-531 Human Values and professional athics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | Sei | BI-523 | Introduction R Programming | 3 | s 15 | |
| Production/ Environmental Law/Tourism and Hospitality management/Life Skills and skill development/Yoga studies Core Course | | Ability Enhancement Cou | urses (AEC): Skill enhancement course | | | |
| Core Course Bi-506 Database Management 2+1 Bi-507 Perl programming for bioinformatics 2+1 Coeditis 18 2+1 Bi-508 Optimization, machine learning and artificial intelligence Optional Course (only one) Bi-514 Complex Algorithms in Bioinformatics 2+1 Bi-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) Bi-524 Statistical Methods in Bioinformatics 3 Bi-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 Bi-531 Human Values and professional Ethics/Gender Sensitization 3 Ethics/Gender Sensitization Core Course Bi-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) Bi-526 Human Genetics and Genome Project 3 Bi-527 NGS data Analysis 2+1 22 22 22 24 22 24 24 2 | | BI-540 | Mushroom Culture/Bio-fertilizer | 3 | | |
| Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | production/ Environmental Law/Tourism | | | |
| Core Course BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | , | | | |
| BI-506 Database Management 2+1 BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 2 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | and skill development/Yoga studies | | | |
| BI-507 Perl programming for bioinformatics 2+1 BI-508 Optimization, machine learning and 2+1 artificial intelligence Optional Course (only one) BI-514 Complex Algorithms in Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | | | | |
| Optional Course (only one) BI-514 | | | | | | |
| Optional Course (only one) BI-514 | | | | | Cre | |
| Optional Course (only one) BI-514 | | BI-508 | , , | 2+1 | dits | |
| BI-514 Complex Algorithms in Bioinformatics 2+1 BI-515 PYTHON programming for Bioinformatics 3 Minor Course (only one) BI-524 Statistical Methods in Bioinformatics 3 BI-525 Bio-safety and Scientific Communications 3 Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | | | 18 | |
| BI-524 Statistical Methods in Bioinformatics BI-525 Bio-safety and Scientific Communications Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional a Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | က္ | | · | | | |
| BI-524 Statistical Methods in Bioinformatics BI-525 Bio-safety and Scientific Communications Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional a Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | ter | | | | | |
| BI-524 Statistical Methods in Bioinformatics BI-525 Bio-safety and Scientific Communications Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional a Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | Jesi | | PYTHON programming for Bioinformatics | 3 | | |
| BI-524 Statistical Methods in Bioinformatics BI-525 Bio-safety and Scientific Communications Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 Human Values and professional a Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | Sen | | | | | |
| Ability Enhancement Compulsory Courses (AECC)AECC2 BI-531 | J , | BI-524 | Statistical Methods in Bioinformatics | 3 | | |
| BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | BI-525 | Bio-safety and Scientific Communications | 3 | | |
| BI-531 Human Values and professional 3 Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | Ability Enhancement Compulsory Courses (AECC)AECC2 | | | | |
| Ethics/Gender Sensitization Core Course BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | † | 3 | | |
| BI-509 Molecular modeling and drug discovery 2+1 Minor Course (Only one) BI-526 Human Genetics and Genome Project 3 BI-527 NGS data Analysis 2+1 Compulsory Course BI-550 Course Seminar 0+1 | | | · | | | |
| Compulsory Course BI-550 Course Seminar 0+1 | | | 1 | | оТ | |
| Compulsory Course BI-550 Course Seminar 0+1 | | BI-509 | Molecular modeling and drug discovery | 2+1 | tal | |
| Compulsory Course BI-550 Course Seminar 0+1 | er-4 | | | | | |
| Compulsory Course BI-550 Course Seminar 0+1 | | BI-526 | Human Genetics and Genome Project | 3 | dits | |
| Compulsory Course BI-550 Course Seminar 0+1 | | BI-527 | NGS data Analysis | 2+1 | s 22 | |
| BI-550 Course Seminar 0+1 BI-560 Thesis/Dissertation 15 | est | | | | | |
| SolutionBI-560Thesis/Dissertation15 | ещ | | | | | |
| | Ň | BI-560 | Thesis/Dissertation | 15 | | |

MASTER OF SCIENCE (PLANT BIOTECHNOLOGY)

| P | aper Code | Paper Name | Credit | |
|----------------|---|------------------------------------|-------------|------------------|
| | Core Course | | | |
| | PBT-501 | Plant Microbial Diversity | 2+1 | |
| | PBT-502 | Molecular Biology | 2+1 | |
| | PBT-503 | Plant Biochemistry | 2+1 | |
| | Optional Course (Only One) | | • | 7 |
| | PBT-510 | Microbiology | 2+1 | ota |
| | PBT-511 | Cell Biology | 2+1 | Total Credits 18 |
| - | Minor Course (Only one) | - | | ed. |
| Semester – | PBT-520 | Computational Biology | 2+1 | its |
| | PBT-521 | Biomathematics and Biostatistics | 2+1 | 18 |
| | Ability Enhancement Compulsory Courses (AECC)AEC | C1 | | |
| S | PBT-530 | Environmental Sustainability/ | 3 | |
| | 151 330 | Swachh Bharat Abhiyan activities/ | | |
| | | Biodiversity and its conservation | | |
| | Core Course | blodiversity and its conservation | | |
| | PBT-504 | Fundamental Genetics | 2+1 | |
| | PBT-505 | Plant Physiology and Metabolism | 2+1 | |
| | | Tranti mysiology and wictabolism | 211 | |
| | Optional Course (only one) | Malagular Madaling and Drug Dasign | 2.1 | |
| | PBT-512 | Molecular Modeling and Drug Design | | ₹ |
| -2 | PBT-513 | Recombinant DNA technology | 3+1 | t a |
| Semester – | Minor Course (only one) | | | Total Credits 15 |
| es | PBT-522 | Enzyme Technology | 2+1 | e di |
| eπ | PBT-523 | Immunochemistry | 2+1 | ts: |
| S | Ability Enhancement Courses (AEC): Skill enhancemen | - | | 15 |
| | PBT-540 | Mushroom Culture/ Bio-fertilizer | 3 | |
| | | production/ Environmental Law/ | | |
| | | Tourism and Hospitality | | |
| | | management/ Life Skills and skill | | |
| | | development/ Yoga studies | | |
| | Core Course | 1 | | |
| | PBT-506 | Bioprocess Technology | 2+1 | |
| | PBT-507 | Plant Biotechnology | 2+1 | |
| | PBT-508 | Molecular Plant breeding | 2+1 | |
| | | | | |
| | Optional Course (only one) | | 1 | |
| | PBT-514 | Plant Stress Biology | 2+1 | 7 |
| د آ | PBT-515 | Photochemistry and Pharmacognosy | 3 | tal |
| ste | | | | Cre Cre |
| Semester-3 | Minor Course (only one) | | | Total Credits 18 |
| Se | PBT-524 | Biosafety and Scientific | 3 | ;; 1 |
| | | Communications | | œ |
| | PBT-525 | Molecular Plant Pathology | 3 | |
| | FB1-323 | Wolecular Flant Fathology | 3 | |
| | Ability Enhancement Compulsory Courses (AECC)AEC | C2 | | |
| | PBT-531 | Human Values and professional | 3 | |
| | | Ethics/Gender Sensitization | | |
| | | | | |
| | Core Course | | | |
| | PBT-509 | Genomics for crop improvement | 2+1 | |
| Semester-4 | Minor Course (only one) | | | |
| | PBT-526 | Proteomics and Metabolomics | 3 | Total Credits 22 |
| | PBT-527 | Plant Developmental Biology | 3 | Cr |
| | Compulsory Course | . Idit Developmental biology | | p e. |
| | PBT-550 | Course Seminar | 1 | its |
| | PBT-560 | Thesis/Dissertation | 15 | 22 |
| | . 2. 550 | Total | 22 | |
| | | iotui | | |

Interdisciplinary Team Members

(Genomics and Bioinformatics)



Prof. Rajesh Singh

Vice Chancellor



Prof. Ajay Singh

Dean, Faculty of Science



Dr. Dinesh Yadav
Designation: Professor
Specialization: Molecular Biology and

Bioinformatics; Plant Biotechnology; Enzyme technology Email: dinesh_yad@rediffmail.com



Dr. Sarad Mishra
Designation: Professor
Specialization: Microbial Enzyme
Technology, Bioinformatics
Email: saradmishra5@gmail.com



Dr. Rajarshi Kumar Gaur
Designation: Professor
Specialization: Plant Virology and
Molecular Biology and Bioinformatics
Email: gaurrajarshi@hotmail.com



Dr. Mahendra Pratap Singh Designation: Associate Professor **Specialization:** Protein Biochemistry,

Cellular and Molecular Toxicology,

Redox Biology

Email: mprataps01@gmail.com



Dr. Ramwant Gupta
Designation: Associate Professor
Specialization: Plant Molecular
Physiology and Molecular Modelling
Email: ramwantgupta@hotmail.com



Dr. Smriti Mall

Designation: Assistant Professor

Specialization: Molecular Plant Pathology and Phytoplasma diseases **Email:** smriti.mall@rediffmail.com



Dr. Ambrish K Srivastava

Designation: Assistant Professor
Specialization: Computational Biophysics,
Biological Activity Predication, Molecular
Docking, QSAR, etc. Computational
Materials Science & Nanoscience
Email: aks.ddugu@gmail.com



Dr. Archana Singh Bhadauria
Designation: Assistant Professor
Specialization: Biomathematics –
Mathematical epidemiology,
Mathematical Ecology
Email: archanasingh93@yahoo.co.in



Dr. Pradeep Kumar Rao Designation: Assistant Professor

Specialization: Computational Chemistry, Molecular Modeling, Atmospheric Reactions and kinetics, Host-Guest type interactions **Email:** pradeeprao.chem@gmail.com



Dr. Sushil Kumar
Designation: Assistant Professor
Specialization: Cell Biology,
Cytogenetics

Email: sushilk731@gmail.com



Dr. Smita Singh

Designation: Assistant Professor **Specialization:** Population Genetics,

Molecular Biology

Email: singhsmita123@gmail.com



Dr. Manish Pratap Singh
Designation: Assistant Professor
Specialization: Cell Biology, Next
generation Sequencing and Epigenetics

Email: manishbtmits@gmail.com



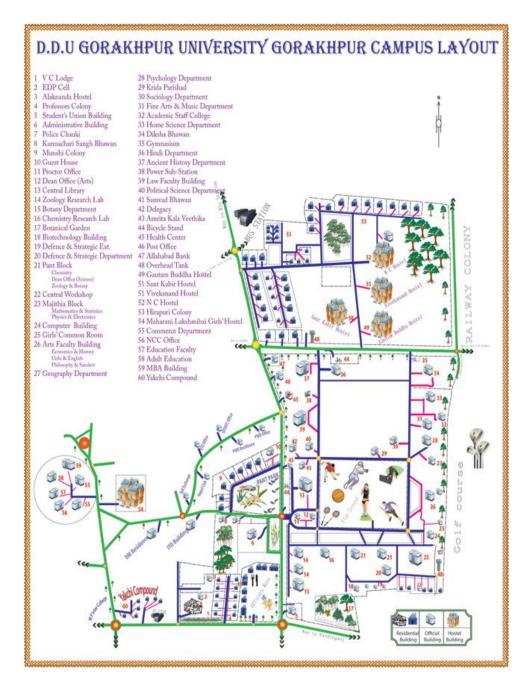
Dr. Noopur Singh Rathore
Designation: Assistant Professor
Specialization: NGS sequencing,
Comparative and Functional Genomics
Email: singh.rajpoot.noopur@gmail.com



Dr. Kumari Sikha

Designation: Assistant Professor Specialization: Genetics and Plant breeding, Plant Genomics

Email: <u>kumarisikha1593@gmail.com</u>



For more information



Dr. Abhai Kumar

Associate Professor

Department of Botany, D.D.U Gorakhpur University Gorakhpur-273009 (Uttar Pradesh) (INDIA)

Mobile-+91-9651629763

Email- singhabhai2000@gmail.com