

ARJUN BATCH

CSIR NET & DBT Merger Programme

for December 2026 Exam

STARTS 4 AUGUST 2026

✓ India's first CSIR NET & DBT combined exam

✓ Live Online + Recorded | Complete Unified 14-Unit Syllabus

✓ FREE 1-month Internship in Bioinformatics or AI-ML Biology

✓ Placement Support, from day one

ARJUN = Aptitude, Research & Judgement for Unified NET

A First-of-its-Kind Exam Needs a First-of-its-Kind Preparation

The CSIR NET and DBT eligibility tests are merging for the first time ever, with the combined exam scheduled for December 2026. No previous cohort has faced this exact pattern, which means recycled, old-pattern coaching will not be enough. The ARJUN Batch, starting 4 August 2026, has been built specifically for this transition: a strategic, syllabus-first, topic-weighted programme designed to help you qualify with confidence.

Because the merged format is new, strategic study matters more than ever. At Biotecnika, we map every topic in the unified syllabus to its likely weightage, prioritise what to study first and deepest, and guide you through structured revision right up to exam day. And you do not wait to qualify to benefit: every enrolled student receives a one-month free AI/ML or Bioinformatics internship plus placement support right away, from the day they join.

Batch at a Glance

Batch Name	ARJUN Batch, CSIR NET & DBT Merger Programme
Full Form	Aptitude, Research & Judgement for Unified NET
Target Exam	CSIR NET & DBT Merger Exam, December 2026
Batch Starts	4 August 2026
Mode	Live Online + Recorded lectures
Syllabus Coverage	Complete unified 14-unit syllabus, taught in full
Approach	Strategic, topic-weighted, high-priority focus first
Career Bonus	1-month free AI/ML or Bioinformatics internship + placement support, from day one
Support	24/7 chat support with extended validity

Why the ARJUN Batch

- **First-of-its-kind exam, first-of-its-kind prep.** Since CSIR NET and DBT have never been merged before, there is no historical cutoff or paper pattern to fall back on. ARJUN is built around the newly released unified syllabus, not recycled old-pattern content.
- **Strategic topic mapping.** We cross-reference the complete syllabus with high-weightage areas to prioritise what to study first, deepest and most often.
- **Both exams, one preparation.** Structured coverage of CSIR NET & DBT combined, not DBT alone and not NET alone, but the full merged framework across all 14 units.
- **Benefit from day one.** Every enrolled student gets a one-month free AI/ML or Bioinformatics internship plus placement support right away, not after qualifying, guided by Biotecnika's academic and career teams.

Programme Features

- Live and recorded lectures covering all 14 units of the unified syllabus.

- Topic-wise practice questions and full-length mock tests.
- Weekly doubt-clearing sessions with expert faculty.
- Printed and digital study material aligned to the unified syllabus.
- A personalised study planner mapped to the December 2026 timeline.
- WhatsApp and Telegram support groups for peer learning and updates.

High-Priority Focus Areas

Based on the weightage pattern of CSIR NET Life Sciences and the DBT-oriented emphasis of the merged exam, the following areas receive extra classroom hours, additional practice sets and dedicated revision modules. The complete unit-wise syllabus follows in the next section.

▶ **Fundamental Processes (Unit 3)**

Replication, transcription, translation and gene regulation carry consistently high weightage. Master mechanisms, enzymes and regulatory logic across prokaryotes and eukaryotes.

▶ **Cell Communication, Immunology and Cancer (Unit 4)**

Signal transduction, innate and adaptive immunity, host-pathogen interaction and cancer biology are recurring high-yield areas.

▶ **Structure and Function of Biomolecules (Unit 1)**

Enzyme kinetics, bioenergetics, protein and nucleic acid conformation and metabolism form the conceptual base for the whole paper.

▶ **Inheritance Biology (Unit 8)**

Mendelian and quantitative genetics, linkage and mapping, and human genetics are heavily tested and highly scoring with practice.

▶ **Methods in Biology (Unit 14)**

Molecular, biophysical and statistical techniques appear across Part B and Part C; strong technique knowledge lifts overall score.

▶ **Bioinformatics and Computational Biology (Unit 11)**

Sequence analysis, structure prediction (including AI-based methods such as AlphaFold) and drug design are growing focus areas in the new pattern.

▶ **Advances in Biotechnology (Unit 13)**

Recombinant DNA technology, medical and agricultural biotechnology and genome editing align directly with the DBT-oriented portion of the merged exam.

▶ **Ecology, Evolution and Diversity (Units 9 and 10)**

Concept-driven and high-scoring; population and community ecology, mechanisms of evolution and biodiversity policy reward structured revision.

Note: high-priority focus areas are guided by exam trends and refined further at batch orientation.

COMPLETE UNIFIED SYLLABUS, CSIR NET & DBT

All fourteen units of the official CSIR NET & DBT syllabus are taught end to end. Every subtopic listed below is covered in the ARJUN Batch.

Highlighted text marks the high-priority, exam-critical topics that receive extra classroom hours and revision focus.

Unit 1. Structure And Function Of Biomolecules

- A. **Structure of atoms, molecules and chemical bonds.**
- B. **Composition, structure and function of biomolecules (carbohydrates, lipids, proteins, nucleic acids and vitamins).**
- C. **Stabilizing interactions (van der Waals, electrostatic, hydrogen bonding, hydrophobic interaction, etc.).**
- D. **Principles of biophysical chemistry (pH, buffer, reaction kinetics, thermodynamics, colligative properties).**
- E. **Bioenergetics, glycolysis, oxidative phosphorylation, coupled reactions, group transfer, biological energy transducers.**
- F. **Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes**
- G. **Conformation of proteins (Ramachandran plot, secondary structure, domains, motif and folds).**
- H. **Conformation of nucleic acids (Structural characteristics of A, B and Z DNA; RNA conformation).**
- I. **Stability of proteins and nucleic acids.**
- J. **Metabolism of carbohydrates, lipids, amino acids, nucleotides and vitamins.** 3

Unit 2. Cellular Organization

- A. Cell wall and cell membrane: structure and function **Cell wall**, physical structure of model membranes in prokaryotes and eukaryotes, **lipid bilayer, membrane proteins, diffusion, osmosis, ion channels, active transport, membrane pumps, mechanism of sorting and regulation of intracellular transport, electrical properties of membranes.**
- B. Structural organization and function of intracellular organelles **Nucleus and its organization and dynamics, mitochondria, Golgi bodies, lysosomes, endoplasmic reticulum, peroxisomes, plastids, vacuoles, chloroplast, structure & function of cytoskeleton and its role in motility.**
- C. Organization of genes and chromosomes **Operon, unique and repetitive DNA, interrupted genes, gene families, structure of chromatin and chromosomes, heterochromatin, euchromatin, transposons.**
- D. Cell division and cell cycle **Mitosis and meiosis, their regulation, steps in cell cycle, regulation and control of cell cycle, apoptosis, necrosis and autophagy.**
- E. Microbial Physiology **Growth kinetics**, strategies of cell division, **stress response, antimicrobial resistance (AMR).**

Unit 3. Fundamental Processes

- A. DNA replication, repair and recombination Unit of replication, **enzymes involved, replication origin and replication fork, fidelity of replication**, extrachromosomal replicons, **DNA damage and repair mechanisms, homologous and site-specific recombination.**
- B. RNA synthesis, processing and regulation **Mechanism and regulation of transcription, transcriptional inhibitors, transcription factors and machinery, transcription activators and repressors, RNA polymerases, capping, RNA processing, RNA editing, splicing, and polyadenylation**, structure and function of different types of RNA, RNA transport, ribozyme, riboswitches, non-coding RNA.
- C. Protein synthesis, processing and degradation **Ribosome, mechanism of translation and its regulation, translational inhibitors, post- translational modification of proteins**, protein trafficking and transport, protein degradation.
- D. Control of gene expression at transcription and translation level **Regulation of gene expression** in phages, viruses, **prokaryotes and eukaryotes, role of chromatin in gene expression and gene silencing, epigenetic regulation.**

Unit 4. Cell Communication And Cell Signaling

- A. Cell signaling **Hormones and their receptors, cell surface receptors, signaling through G-protein coupled receptors, signal transduction pathways, second messengers, regulation of signaling pathways, bacterial and plant two-component systems, light-signaling in plants, bacterial chemotaxis and quorum sensing.**
- B. Cellular communication **General principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins, neurotransmission** and its regulation, regulation of haematopoiesis.
- C. Innate and adaptive immune system **Cells and molecules involved in innate and adaptive immunity, antigens, antigenicity and immunogenicity, B and T cell epitopes, structure and function of antibody molecules, generation of antibody diversity, monoclonal antibodies, antibody engineering, antigen- antibody interactions, MHC molecules, antigen processing and presentation, activation and differentiation of B and T cells, B and T cell receptors, humoral and cell- mediated immune responses, primary and secondary immune modulation, the complement system, Toll-like receptors, cell-mediated effector functions, inflammation,** hypersensitivity and autoimmunity, immune response during bacterial, parasitic and viral infections, congenital and acquired immunodeficiencies, vaccines.
- D. Host pathogen interaction **Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells,** alteration of host cell behaviour by pathogens, **virus-induced cell transformation, pathogen-induced diseases in animals and plants,** cell-cell fusion in both normal and abnormal cells.
- E. Cancer **Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, virus-induced cancer,** metastasis, interaction of cancer cells with normal cells, **therapeutic interventions of uncontrolled cell growth.**

Unit 5. Developmental Biology

- A. Basic concepts of development **Potency, commitment, specification, induction, competence, determination and differentiation, morphogenetic gradients, cell fate and cell lineages, stem cells,** genomic equivalence and the cytoplasmic determinants, imprinting, mutants and transgenics in analysis of development.
- B. Gametogenesis, fertilization and early development **Production of gametes, cell surface molecules in sperm-egg recognition in animals, zygote formation, cleavage, blastula formation, embryonic fields, gastrulation and formation of germ layers in animals. Male gametophyte development, embryo sac development and double fertilization in plants, embryogenesis,** establishment of symmetry in plants, seed formation, embryo and endosperm developmental dynamics and germination.
- C. Morphogenesis and organogenesis in animals **Cell aggregation and differentiation in Dictyostelium, axes and pattern formation in Drosophila,** amphibia and chick; organogenesis - **vulva formation in Caenorhabditis elegans, eye lens induction, limb development and regeneration in vertebrates, differentiation of neurons,** post embryonic development - larval formation, metamorphosis; environmental regulation of normal development; **sex determination.**
- D. Morphogenesis and organogenesis in plants **Organization of shoot and root apical meristem,** shoot and root development, leaf development and phyllotaxy, **transition to flowering, floral meristems, organogenesis and floral development.**
- E. **Programmed cell death,** aging and senescence in animals and plants

Unit 6. System Physiology, Plant

- A. Photosynthesis **Light harvesting complexes, mechanisms of electron transport, photoprotective mechanisms, CO₂ fixation - C₃, C₄ and CAM pathways.**
- B. **Respiration and photorespiration Citric acid cycle, plant mitochondrial electron transport and ATP synthesis, alternate oxidase, photorespiratory pathway.**
- C. **Nitrogen metabolism Nitrate and ammonium assimilation;** amino acid biosynthesis, **biological nitrogen fixation.**
- D. Plant hormones **Biosynthesis,** storage, breakdown and transport, **physiological effects and mechanisms of action.**

- E. **Sensory photobiology** Light perception, structure, function and mechanisms of action of phytochromes, cryptochromes and phototropins, stomatal movement, photoperiodism and biological clock.
- F. **Solute transport and photoassimilate translocation** Uptake, transport and translocation of water, ions, solutes and macromolecules from soil, through cells, across membranes, through xylem and phloem, transpiration, mechanisms of loading and unloading of photoassimilates.
- G. **Secondary metabolites** Biosynthesis of terpenes, phenolics, alkaloids, phenylpropanoids, nitrogenous compounds and their roles, metabolic engineering in plants.
- H. **Stress physiology** Physiological and molecular responses of plants to biotic and abiotic stresses, innate immunity.

Unit 7. System Physiology, Animal

- A. **Blood and circulation** Blood corpuscles, haemopoiesis and formed elements, plasma function, blood volume, blood volume regulation, blood groups, haemoglobin, immunity, haemostasis.
- B. **Cardiovascular system** Comparative anatomy of heart structure, myogenic heart, specialized tissue, ECG – its principle and significance, cardiac cycle, heart as a pump, blood pressure, neural and chemical regulation of cardiovascular system.
- C. **Respiratory system** Comparison of respiration in different species, anatomical considerations, transport of gases, exchange of gases, waste elimination, neural and chemical regulation of respiration.
- D. **Nervous system** Neurons, action potential, gross neuroanatomy of the brain and spinal cord, central and peripheral nervous system, neural control of muscle tone and posture.
- E. **Sense organs:** Vision, hearing and tactile responses.
- F. **Excretory system** Comparative physiology of excretion, kidney, urine formation, urine concentration, waste elimination, micturition, regulation of water balance, blood volume, blood pressure, electrolyte balance, acid-base balance.
- G. **Thermoregulation:** Comfort zone, body temperature – physical, chemical, neural regulation, acclimatization.
- H. **Stress and adaptation**
- I. **Digestive system:** Digestion, absorption, energy balance, BMR.
- J. **Endocrinology and reproduction:** Endocrine glands, basic mechanism of hormone action, hormones and diseases; reproductive processes, gametogenesis, ovulation, neuroendocrine regulation.
- K. **Concept of metaorganisms/holobionts:** Gut microbiome in physiology; study of gut microbiome; germ-free animals; gut-brain axis, dysbiosis, and disease
- L. **Interorgan communication and energy homeostasis;** metabolic health and disorders

Unit 8. Inheritance Biology

- A. **Chromosomal and extrachromosomal inheritance** Principles of Mendelian inheritance, codominance, incomplete dominance, penetrance and expressivity, gene interactions, pleiotropy, genomic imprinting, linkage and cross-over, sex-linked inheritance, inheritance of mitochondrial and chloroplast genes, maternal inheritance.
- B. **Genes and mutations** Allele, multiple alleles, pseudoallele, complementation tests; Mutation types, causes and detection; mutant types – lethal, conditional, biochemical, loss of function, gain of function, dominant-negative; germinal verses somatic mutations.
- C. **Genetic analysis** Linkage maps, mapping with molecular markers in plants, animals and bacteria, tetrad analysis, gene transfer in bacteria: transformation, conjugation, transduction, sex-duction, fine structure analysis of gene, development of mapping population in plants.
- D. **Human genetics** Pedigree analysis, LOD score for linkage testing, karyotypes, genetic disorders.
- E. **Quantitative genetics** Population genetics and Hardy-Weinberg equilibrium, polygenic inheritance, heritability and its measurements, molecular mapping.

- F. Structural and numerical alterations of chromosomes Recombination, **deletion, duplication, inversion, translocation, ploidy and their genetic implications.** 10

Unit 9. Evolution And Diversity Of Life Forms

- A. Evolution of Life and Life Forms **Origin of life and early evolution;** Evolution of cellular structures, functions and multicellularity; **Mechanisms of evolution - Natural selection, genetic drift, gene flow, and mutation; Mechanisms of speciation; Extinction events and their role in shaping biodiversity; Adaptive radiation and convergent evolution;** Coevolution and evolutionary arms races; **Human evolution.**
- B. Principles & Methods of Taxonomy **Concepts of species** and hierarchical taxa, **biological nomenclature, classical & quantitative methods of taxonomy of plants, animals and microorganisms.**
- C. Microbial Life **Bacteria and Archaea: diversity and ecological roles;** Viruses: structure, replication, and impact on life; **Economically and pathologically important microbes.**
- D. Protists **Algae; Protozoa; Slime molds and water molds;** Ecological roles of protists.
- E. Fungi **Diversity of fungal groups: chytrids, zygomycetes, glomeromycetes, ascomycetes, and basidiomycetes; Important fungal pathogens of plants and humans.**
- F. Plant Life **Evolution and diversity of land plants: bryophytes, ferns, gymnosperms, and angiosperms; Plant morphology, anatomy, and reproduction.**
- G. Animal Life **Evolutionary relationships and key characteristics of Invertebrates and Vertebrates.**

Unit 10. Ecology and Behavioural Biology

- A. Introduction to Ecology Levels of organization- individual, population, community, ecosystem, biosphere; Abiotic and biotic ecological factors, Ecological adaptations.
- B. Population Ecology **Population growth models- Exponential growth, logistic growth, density-dependent and density-independent factors, life tables, survivorship curves; Population dynamics- Age structure, sex ratio, life history strategies (r-selected vs. K-selected);** Metapopulations- Habitat fragmentation, connectivity, and extinction risk.
- C. Community Ecology **Community structure - Food webs, trophic levels, keystone species; Species interactions - Competition, predation, mutualism, parasitism; Succession- Primary and secondary succession, community stability.**
- D. Ecosystem Ecology **Energy flow in ecosystems- Primary production, trophic levels, energy pyramids;** Biogeochemical cycles- Carbon, nitrogen, phosphorus, water cycles; Ecosystem services and human impacts.
- E. Human Impacts on Ecosystems Anthropogenic pressures: Land use and land-cover change; Climate change, pollution, invasive species.
- F. Biodiversity and Conservation **Biodiversity and its importance; Threats to biodiversity; IUCN categories of threat; Conservation genetics;** Population viability analysis (PVA); **Ex-situ and in-situ conservation strategies;** Community-based conservation and the role of indigenous knowledge; **International and national conservation policies and legislation.**
- G. Act and policies Biodiversity Act 2002; Agricultural biodiversity; International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA); Conservation strategies for seed gene bank; Climate change and conservation of plant genetic resources; Strategies on PPVFR and Biodiversity Acts.
- H. Behavioural Ecology **Introduction to animal behaviour- Proximate and ultimate causes of behaviour; Foraging behaviour; Communication; Conflict and aggression; Migration, dispersal, and navigation; Social behaviour; Sexual selection and mating systems; Parental care.**

Unit 11. Bioinformatics And Computational Biology

- A. Major Bioinformatic Resources **Sequence databases,** gene expression databases, **3D structure database,** pattern sequence databases.

- B. Basic Concepts of Sequence Analysis **Database searches, BLAST and FASTA, sequence identity and similarity, definitions of homologues, orthologues, paralogues, repeat finding, scoring matrix, pairwise sequence alignments, multiple sequence alignments (MSA), application in taxonomy and phylogeny, comparative genomics.**
- C. Gene annotation Prediction of gene function using homology, context, structures, **networks; Genetic variation-polymorphism, deleterious mutations; Phylogenetics.**
- D. Molecular Modelling and Dynamics **3-D structure visualization and simulation, Basic concepts in molecular modeling, Molecular Mechanics, Force fields etc.**
- E. Classification and comparison of protein 3D structures **Anatomy of proteins – Hierarchical organization of protein structure, Secondary and tertiary structure prediction, homology/comparative modeling, fold recognition, threading approaches, and ab initio structure prediction methods, AI-based methods of structure prediction (eg. AlphaFold).**
- F. Drug design **Chemical databases like NCI /PUBCHEM, Fundamentals of Receptor-ligand interactions, Structure-based drug design, Ligand based drug design: Structure-Activity Relationship, QSARs and pharmacophores, in silico predictions of drug activity and ADMET.**
- G. Systems Biology **Data science applications in biology, health and drug discovery,** mathematical modelling of metabolic pathways and disease, digital health, **personalized medicine.**

Unit 12. Biochemical Engineering And Industrial Biotechnology

- A. Introductory Mathematics Calculus review, Ordinary differential equations, Second and higher order differential equations, Linear algebra, Numerical methods.
- B. Engineering Principles **Material and energy balance, Steady state energy and material balance,** Properties of substances, Introduction to transport phenomena, momentum transfer, **heat and mass transfer,** Introduction to mass transfer equipment.
- C. Thermodynamics in Biological Systems **First and second law of thermodynamics,** Biological systems as open non-equilibrium systems, Failure of classical thermodynamics in describing biological processes, Concepts of thermodynamics flux and force, **Concept of entropy production, Constitutive equations, Thermodynamics of coupled biochemical reactions, Thermodynamic analysis of oxidative phosphorylation, Glycolytic oscillations;** biological clocks.
- D. Bioprocess Engineering and Technology **Principles of microbial growth and factors affecting growth, Growth kinetics and substrate utilization in batch, fed-batch and continuous systems, Introduction to bioreactors: batch and fed-batch, plug flow, continuous,** enzyme reactors, **Sterilization,** Mass and energy balance in microbial process-effects of dissolved oxygen, **Mass transfer of oxygen, aeration and agitation, fluid rheology, Fermentation technology for antibiotics, organic acids, alcohol, bioplastics, vitamins,** enzymes; biotransformation of steroids, Process flow sheet and process economics.
- E. Enzymes and microbial technology Enzymes in organic solvents and ionic liquids, biocatalysts, enzyme engineering, random and rational approach to protein engineering, Biocatalysis, **techniques of immobilization of enzymes and whole cells:** design, **operation and kinetics of immobilized enzyme reactors, diffusional resistance and Thiele modulus.**
- F. Downstream processing in biotechnology Biomass removal and disruption, **Precipitation by salts, solvents, Membrane based purification, Adsorption and chromatography,** Extraction (solvent, **aqueous two-phase, super critical),** Drying.
- G. Bioprocess Plant Design General design information, Process flow sheet, Scale-up and scale-down issues, Scale up of downstream processes. Selection and specifications of bioprocess equipment.
- H. Metabolic Engineering and Synthetic Biology

Unit 13. Advances In Biotechnology

- A. Recombinant DNA technology **Molecular cloning,** expression of recombinant proteins, In vitro mutagenesis and deletion techniques, gene knock out in bacterial and eukaryotic organisms, **genome editing techniques. Protein sequencing methods, DNA sequencing methods, strategies for genome sequencing and gene expression analysis.**
- B. Medical Biotechnology **Application of immunological principles (autoimmunity, transplantation, tumor immunology, stem cell therapy, cell-based vaccines), vaccines (Live, killed, attenuated, subunit, and recombinant nucleic acid**

vaccines) and diagnostics, adjuvants, cell therapy, stem cell therapy, immunotherapy, r-DNA based therapy, antibody engineering, phage display libraries, tissue engineering. Stem cell technology: induced pluripotent stem cells, guided/directed differentiation methods; application in drug screening and disease biology; Organoid: Stem-cell based, self-organizing 3D models for disease and developmental biology. Neurobiology: Electrophysiological studies of the brain, behavioural tests. **Medical devices and implants, Biosensors**

- C. Animal Biotechnology **Transgenic animals**, animal breeding, **conservation of germplasm**, genetic health monitoring, molecular medicine and surgery, concept of molecular diagnosis of pathogens, **cell cloning and selection, cell and tissue culture methods in biotechnological applications.**
- D. Agriculture Biotechnology **Transgenic plants**, molecular approaches to diagnosis and strain identification; genomics and its application to agriculture, development of ESTs, **molecular markers for plant genotyping and germplasm analysis, marker assisted breeding for various traits**, foreground and background selection, **gene introgression and pyramiding**, non-gel based techniques for plant genotyping, impact of GE crops on biodiversity; **tissue and cell culture methods in plants**, plantibodies.
- E. Marine Biotechnology **Important marine organisms**, their biology and behaviour, marine resources assessment, Population study and marine environment protection, **role of microbes in marine environment**, microbial metabolites, seafood microbiology, marine pharmacology, fouling and corrosion, **biofilms**; oceanography
- F. Environmental Biotechnology **Wastewater treatment systems**, Pollution control, Environment friendly technologies: Biosurfactants, biofertilizers, biopesticides, microbially enhanced oil recovery, integrated waste management, biogas & biofuel from waste, **bioremediation, phytoremediation.**

Unit 14. Methods In Biology

- A. Molecular Biology Techniques Isolation, separation and analysis of biological macromolecules (DNA, RNA, proteins, carbohydrates and lipids), **chromatography, electrophoresis and centrifugation.**
- B. Biophysical Methods **Spectroscopy (UV/visible, fluorescence, circular dichroism, NMR and ESR), molecular structure determination using X-ray diffraction, cryo-electron microscopy and NMR, Molecular analysis using light scattering, different types of mass spectrometry methods and surface plasma resonance.**
- C. Genomics, Transcriptomics, Proteomics and Metabolomics Structure and organization of prokaryotic and eukaryotic genomes, Comparative genomics, Global gene expression analysis, Comparative transcriptomics, **Differential gene expression**; protein interaction analysis and mapping, targeted and untargeted metabolic profiling, **DNA finger printing and its applications, DNA bar coding, Single-cell sequencing, single-cell omics.**
- D. Radiolabeling techniques Detection and measurement of **different types of radioisotopes normally used in biology**, incorporation of radioisotopes in biological tissues and cells, molecular imaging of radioactive material, safety guidelines.
- E. Histochemical and Immunotechniques **Antibody generation, Detection of molecules using ELISA, RIA, western blot, immunoprecipitation, flow cytometry and immunofluorescence microscopy, detection of molecules in living cells, in situ localization by techniques such as FISH and GISH.**
- F. Microscopic techniques **Visualization of cells and subcellular components by light microscopy and advanced microscopic techniques, resolving power of microscopes, microscopy of living cells, scanning and transmission microscopes, sample preparation techniques for microscopy.**
- G. Electrophysiological methods **Single neuron recording, patch-clamp recording, ECG, Brain activity recording, lesion and stimulation of brain, pharmacological testing, PET, MRI, fMRI, CAT.**
- H. Methods in field biology **Methods of estimating population density of animals and plants**, ranging patterns through direct, indirect and remote observations, sampling methods in the study of behaviour, habitat characterization: **ground and remote sensing methods.**
- I. Statistical Methods Concepts of precision and accuracy in experimental measurements, signal to noise ratio, **Measures of central tendency and dispersal; probability distributions (Binomial, Poisson and normal); Sampling distribution;**

Difference between parametric and non-parametric statistics; Confidence Interval; Errors; Levels of significance; Regression and Correlation; t-test; Analysis of variance; X2 test; basic introduction to multivariate statistics, etc.

- J. IPR, Biosafety and Bioethics **Intellectual property rights, types of IP,** Patent databases; Biological safety measures, biosafety levels, regulatory guidelines, animal ethics, research ethics, publication ethics, plagiarism, use of AI in research and publication.

MEET YOUR FACULTY

The ARJUN Batch is led by CSIR-NET and GATE qualified subject experts with decades of combined teaching, mentoring and research experience across the life sciences.



Mrs. Tithi Saha

Academic Manager, Competitive Exams

Subject Expert, Genetics and Molecular Biology

16+ years teaching | UGC-CSIR NET (LS) 2009, Gold Medallist | 1 research article + 1 book chapter

Tithi Saha is a seasoned educator and life sciences expert with a strong academic and research background in Biotechnology. She holds a Master's degree in Biotechnology from Nirma University, Ahmedabad, and qualified CSIR-NET in 2009. She began her career as an Assistant Professor at Guru Ghasidas Vishwavidyalaya, Bilaspur, and has been an integral part of Biotecnika for the past 12 years, currently as Category Head of Competitive Exams. Her areas of expertise include Genetics, Molecular Biology, Molecular Tools and Evolution, and she is known for her clarity of concepts and structured teaching approach.



Dr. Tanushree Saxena

Academic Manager, Clinical Research and Allied Fields

Subject Expert, Biotechnology

10 yrs teaching + 5 yrs research | PhD + B.Ed | 6 papers + 6 book chapters | DAAD Fellowship

Dr. Tanushree Saxena is an accomplished expert in Genetics, Molecular Biology and Research Techniques, with a Ph.D. in Biotechnology. Her academic journey includes a significant research tenure at the Birla Institute of Scientific Research (BISR), a sister concern of BIT Mesra, Ranchi. A recipient of the prestigious DAAD Fellowship, she attended a summer school at Leibniz University, Hannover, Germany. She has consistently topped her classes and holds multiple awards for oral and poster presentations at national and international conferences.



Mrs. Urmimala Ray

Academic Manager, Bio-IT Department

Subject Expert, Biochemistry

16+ years teaching | CSIR-NET JRF (AIR 62, Jun 2015; AIR 76, Dec 2017) | 2 research papers

Urmimala Ray brings over 16 years of experience in life sciences teaching, academic leadership and research-focused training. As Academic Category Manager for the Bio-IT team, she oversees academic strategy and course delivery for specialised programmes in bioinformatics, AI/ML and computational biology. Her expertise spans biochemistry, cell and molecular biology, and she has mentored B.Sc., M.Sc., CSIR NET, GATE and DBT aspirants. A CSIR-NET JRF qualified scholar, she has received the Biotecnika Legacy Award and Best Faculty Award.



Mrs. Somrhita Pal

Subject Expert

Subject Expert, Plant Biotechnology and Environmental Sciences

12+ years teaching | B.Ed, UGC-CSIR NET 2019 | 3 research papers

Somrhita Pal holds an M.Sc. and B.Ed. along with NET qualification, and has been actively involved in academics for over 11 years, specialising in Cell Biology, Genetics and Plant Biotechnology. A Master's from Calcutta University, she taught at college level for five years before joining Biotecnika, and has served as an instructor in a UGC-sponsored National Workshop on Mushroom Cultivation. Her research, published in

national and international platforms, focuses on plant regeneration, morphogenesis and sustainable agriculture.

Dr. Nupur Nagwekar

Subject Expert

Subject Expert, Plant Physiology

NN

9+ years teaching | UGC-CSIR NET 2013, PhD (ICT Mumbai) | 2 research papers as first author

Dr. Nupur Nagwekar cleared the CSIR NET exam in 2013 and completed her Ph.D. in Biotechnology from the Institute of Chemical Technology, Mumbai, in 2019. She has been associated with Biotecnika as faculty since 2019 and is an R&D consultant in the food sector, with a focus on dehydration and novel processing of plant-based materials. Her certifications include the Nexus Preincubation Program and a Python certification course.



Ms. Himani Agarwal

Subject Expert

Subject Expert, Cell Biology and Bioprocess Engineering

5+ years teaching and research | GATE BT 2019, NGS, CRISPR | 6 research articles + 2 book chapters

Himani Agarwal is a final-year Ph.D. scholar in Biotechnology with a research focus on plant growth, development and stress physiology. She earned her B.Sc. (Hons) and M.Sc. in Biotechnology and Bioinformatics from North Eastern Hill University (NEHU), Shillong, securing the Bronze Medal in both degrees, and qualified GATE (BT) in 2019. With over four years of research experience as a Junior Research Fellow at ICAR-NEH, Umiam, and Amity University, Noida, she has authored six Scopus-indexed research and review articles.



Dr. Prangya Rath

Subject Expert

Subject Expert, Plant Physiology

6 yrs research + 1.5 yrs teaching | PhD, TIFR rank holder 2015 | CSIR NET LS 2016 & 2017, CSIR JRF 2017 | 40 papers + 1 book

Dr. Prangya Rath is a CSIR-SRF NET (Life Sciences) qualified researcher and academician working across life sciences, biotechnology, molecular biology and cancer biology. She completed her graduation in Zoology (Hons) from Delhi University, post-graduation in Biotechnology from South Asian University, Delhi, and her Ph.D. from Amity University with CSIR funding. She has qualified CSIR UGC NET (Lectureship) in 2013 and 2016, CSIR JRF and NET in 2017, and CSIR SRF and NET in 2021, and has published over 30 scientific articles.

Career Support, From Day One

Because this is a first-time merger exam, Biotecnika goes a step further than exam prep alone. You do not have to wait until results to gain real, hands-on experience. The moment you enrol, your career support begins.

- **One-month free internship, right away.** Every enrolled student receives a one-month free internship in AI/ML or Bioinformatics, granted on joining and not conditional on qualifying the exam.
- **Placement support.** Access to Biotecnika's placement network and career guidance throughout your journey.
- **Career mapping guidance.** Structured direction on research, teaching and industry pathways in the life sciences.

Who Should Join

- M.Sc. and M.Tech students in Life Sciences, Biotechnology and allied fields aiming for JRF and Lectureship.
- Working professionals preparing for CSIR NET & DBT eligibility.
- Repeat aspirants who want a syllabus-first, strategy-driven approach for the new merged format.

Unwavering Support, Every Step of the Way

Feature	What You Get
24/7 Chat Support	Instant assistance for academic, technical or career issues.
Continuous Analytics	Regular performance feedback through tests.
360° Preparation	Comprehensive coverage right up until exam day.
Extended Validity Support	If the exam date is postponed, our support extends with it.

Prepare with India's Most Trusted Bio-Sciences Academy.

Enrol Now, Secure Your Seat in the ARJUN Batch

CSIR NET & DBT Merger Exam · December 2026

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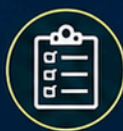
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