



MEER SIR ACADEMY

MSc Biosciences Comparative Entrance Syllabus

JMI AMU CUET PG

Admission Session 2027-28

This guide compares the broad biosciences entrance routes available through Jamia Millia Islamia, Aligarh Muslim University and CUET PG. The programme names are not identical: JMI offers M.Sc. Biosciences, AMU offers related specialist Life Sciences programmes, and CUET PG provides Life Sciences and Integrative Biosciences test papers.

Comparison at a Glance

Feature	JMI	AMU	CUET PG
Closest programme	M.Sc. Biosciences	No standalone M.Sc. Biosciences; closest broad route is M.Sc. Biotechnology	Life Sciences SCQP17 or Nanoscience Integrative Biosciences SCQP22
Selection route	JMI entrance test	AMU Admission Test for Biotechnology	CUET PG score used by participating universities
Core focus	Integrated biological sciences	Chemistry, Botany, Zoology and elementary Mathematics	SCQP17 is biology-centred; SCQP22 combines sciences with biology
Best preparation base	UG Biosciences and Life Sciences	Broad science foundation with life sciences	Follow the exact chosen paper code syllabus



Common Core for All Three Routes

Candidates can prepare a shared foundation first and then add the institution-specific components. The common core has the highest return across JMI, AMU and CUET PG.

- Cell structure, organelles, membranes, cell cycle, cell division, signalling and apoptosis
- Biochemistry of carbohydrates, lipids, proteins, nucleic acids, vitamins, enzymes and metabolism
- Molecular biology including replication, transcription, translation, gene regulation and DNA repair
- Classical, molecular and population genetics; linkage, recombination, mutations and chromosomal variation
- Microbiology, microbial diversity, growth, viruses, antimicrobial agents and environmental microbiology
- Immunology including innate and adaptive immunity, antigens, antibodies, complement and vaccines
- Plant anatomy, physiology, photosynthesis, mineral nutrition, hormones and plant diversity
- Animal diversity, human anatomy and physiology, endocrinology, reproduction and human disease
- Ecology, evolution, biodiversity, pollution and biogeochemical cycles
- Biological techniques such as microscopy, chromatography, electrophoresis, centrifugation, spectroscopy and PCR

Topic Priority Summary

Highest priority: Cell Biology, Biochemistry, Molecular Biology, Genetics, Microbiology, Immunology and Experimental Techniques. Secondary priority: Plant and Animal Diversity, Physiology, Ecology, Evolution, Biostatistics and Bioinformatics. Add Chemistry and elementary Mathematics particularly for the AMU Biotechnology route.

JMI M.Sc. Biosciences

Official programme status: JMI lists M.Sc. Biosciences as a regular four-semester programme in the Department of Biosciences. The current academic curriculum confirms an integrated biosciences structure with biochemistry, cell biology, genetics, physiology, microbiology and molecular biology.

Entrance Preparation Coverage

Biochemistry

- Biomolecules and macromolecular structure
- Carbohydrate, lipid, amino-acid and nucleotide metabolism
- Bioenergetics, respiratory chain and oxidative phosphorylation
- Enzyme kinetics, inhibition and regulation

Cell Biology and Genetics

- Cell organelles, cytoskeleton and membrane transport
- Cell cycle, cell signalling, apoptosis and cancer biology
- Chromatin, chromosomes, mutations, recombination and DNA repair
- Mendelian and population genetics, Hardy-Weinberg equilibrium and evolution

Diversity and Physiology

- Plant and animal diversity and classification



- Animal physiology: circulation, respiration, digestion, excretion, nervous and endocrine systems
- Plant physiology: water relations, mineral nutrition, photosynthesis, respiration, growth and hormones

Microbiology and Immunology

- Microbial classification, bacterial structure, growth and control
- Viruses, bacteriophages, pathogenesis and antimicrobial resistance
- Innate and adaptive immunity, antigens, antibodies, MHC and immune responses

Techniques and Quantitative Biology

- Microscopy, spectroscopy, chromatography, electrophoresis and centrifugation
- PCR and molecular methods
- Bioinformatics databases, sequence analysis and BLAST
- Biostatistics, probability, hypothesis testing, correlation and regression

Environment and Applied Biosciences

- Ecology, ecosystems, biodiversity and environmental pollution
- Toxicology and xenobiotic metabolism
- Recombinant DNA technology, transgenesis, molecular diagnosis and gene therapy

AMU Related Biosciences Route

Programme mapping: AMU does not list a standalone programme titled M.Sc. Biosciences in its 2026-27 Faculty of Life Sciences admissions. The closest broad-based option is M.Sc. Biotechnology. AMU also offers M.Sc. Biochemistry, Botany and Zoology as separate specialist programmes.

M.Sc. Biotechnology Admission Test

Official test pattern: One objective-type paper of 100 marks comprising 100 questions on Chemistry, Botany, Zoology and Elementary Mathematics.

Chemistry

- Atomic structure, periodic properties and chemical bonding
- Acids, bases, buffers, redox reactions and electrochemistry
- Thermodynamics, chemical equilibrium and reaction kinetics
- Organic functional groups, stereochemistry and biomolecules

Botany

- Plant diversity: algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms
- Plant anatomy, morphology, taxonomy and economic botany
- Plant physiology: water relations, nutrition, photosynthesis, respiration, growth and development
- Plant genetics, ecology, pathology and biotechnology

Zoology

- Invertebrate and vertebrate diversity and classification
- Comparative anatomy, development and evolution
- Animal and human physiology, endocrinology and reproduction



- Cell biology, genetics, ecology, immunology and parasitology

Elementary Mathematics

- Arithmetic, ratio, proportion, percentage and averages
- Algebra, equations, logarithms and basic functions
- Graphs, basic probability and data interpretation

Specialist route note: Applicants targeting AMU M.Sc. Biochemistry, Botany or Zoology should additionally revise the full undergraduate syllabus of the chosen discipline because each uses a separate departmental test.

CUET PG Life Sciences SCQP17

Official paper pattern: 75 compulsory questions based entirely on subject-specific knowledge. The paper is bilingual in English and Hindi.

Techniques

- Chromatography, spectroscopy and microscopy
- Electrophoresis, centrifugation, blotting, PCR and radioisotope techniques

Chromatin Structure and Function

- Prokaryotic and eukaryotic chromosome organisation
- Chromatin types, centromere, telomere and gene concept

Biochemistry

- Structures and functions of proteins, DNA, carbohydrates, lipids and vitamins
- Bioenergetics, glycolysis, TCA cycle, electron transport and ATP synthesis
- Fatty-acid oxidation and synthesis; membrane structure and function

Biotechnology

- Recombinant DNA technology, gene cloning and applications
- Plant and animal cell culture; medical, industrial, agricultural and environmental biotechnology

Microbiology and Immunology

- Microbial diversity and bacterial reproduction
- Antimicrobial agents, industrial and agricultural microbiology
- Antigen, antibody, complement, immunity, vaccines and viruses

Molecular Genetics

- Inheritance, linkage, crossing over and chromosomal aberrations
- Extrachromosomal inheritance, replication, transcription, translation, DNA repair and population genetics

Plant Sciences

- Bryophytes, pteridophytes, gymnosperms and angiosperms
- Plant vascular system, economic plants, photosynthesis, photoperiodism, vernalisation and biogeochemical cycles



Animal Sciences

- Invertebrate and vertebrate characteristics
- Human anatomy and physiology, nerve impulse, endocrinology and disease
- Apoptosis, cancer, inherited disease and animal cell culture

CUET PG Integrative Biosciences SCQP22

SCQP22 is broader and more interdisciplinary than SCQP17. It combines chemistry, physics and biological sciences, so candidates should choose it only when the target university maps its programme to this paper code.

Inorganic Chemistry

- Quantum numbers, periodic trends and s, p, d and f block elements
- Ionic bonding, lattice energy, Born-Haber cycle and crystal structures
- Valence bond, molecular orbital and VSEPR theories
- Acid-base concepts, HSAB principle and coordination chemistry

Physical and Organic Chemistry

- Thermodynamics, entropy, Gibbs energy and spontaneity
- Solutions, pH, buffers, kinetic theory and chemical kinetics
- Reaction intermediates and addition, elimination and substitution reactions
- Stereochemistry, optical activity, chirality and R/S notation

Physics

- Classical mechanics, quantum concepts and atomic orbitals
- Energy bands, semiconductors, optics and magnetic properties
- Crystal structure, Bragg diffraction, thermodynamics and nanomaterial size effects

Biological Sciences

- Evolution, origin of life and biological classification
- Plant and animal anatomy and physiology
- Cell biology, molecular biology, DNA repair and cell division
- Biochemistry, enzymes, kidney and liver function tests
- Ecology, immunology, microbiology, genetics and gene therapy
- Vectors, cloning, expression and DNA transformation techniques

Recommended Preparation Plan

- Phase 1: Complete Cell Biology, Biochemistry, Molecular Biology, Genetics, Microbiology and Immunology.
- Phase 2: Cover Plant Sciences, Animal Sciences, Physiology, Ecology and Evolution.



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*We Deliver Results,
Not Promises.*

- Phase 3: Practise biological techniques, data interpretation, bioinformatics and biostatistics.
- For AMU Biotechnology, add Chemistry and Elementary Mathematics.
- For CUET PG, confirm the paper code accepted by the target university before beginning specialised preparation.
- Revise with topic-wise MCQs, diagrams, metabolic pathways and timed full-length mock tests.

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