



MEER SIR ACADEMY

MSc Biophysics Comparative Entrance Syllabus

Jamia Millia Islamia • Aligarh Muslim University • CUET PG

Admission Session 2027–28

A route-wise syllabus guide for candidates preparing across physics and life-science backgrounds.

How to use this guide

The three labels do not represent identical admission routes. JMI offers a named M.Sc. Biophysics programme and conducts its own entrance test. The AMU 2026–27 admission guide does not list a standalone M.Sc. Biophysics; candidates must choose a related programme such as Physics, Biochemistry or Biotechnology. CUET PG does not publish a separate Biophysics paper code, so applicants must use the paper code accepted by the university they are targeting—most commonly Physics SCQP24 or Life Sciences SCQP17 for biophysics-related study.

The syllabus below therefore separates official facts from a practical preparation framework. Always match the final paper code with the current programme eligibility and university mapping before applying.

At a glance

Route	Programme status	Entrance route	What to prepare
JMI	Standalone M.Sc. Biophysics; regular; four semesters	JMI university entrance test. In 2026 the listed test duration was 90 minutes.	Interdisciplinary undergraduate fundamentals: biology, chemistry, physics, mathematics and core biophysical methods.
AMU	No standalone M.Sc. Biophysics found in the 2026–27 official admission guide.	Departmental/admission test for the related programme selected.	Use the relevant syllabus: M.Sc. Physics, M.Sc. Biochemistry or M.Sc. Biotechnology.



Route	Programme status	Entrance route	What to prepare
CUET PG	No dedicated Biophysics subject paper appears in the official 2026 Science list.	Paper code depends on the accepting university/programme.	SCQP24 Physics and/or SCQP17 Life Sciences; verify the programme mapping before registration.

Common preparation core

- Mathematical tools: algebra, calculus, vectors, differential equations, graphs, probability and basic statistics.
- Physics: mechanics, waves, optics, electricity and magnetism, thermodynamics, statistical ideas, quantum and nuclear physics.
- Life sciences: cell biology, biomolecules, metabolism, molecular biology, genetics, physiology and microbiology.
- Biophysical chemistry: pH and buffers, chemical bonding, energetics, kinetics, diffusion, osmosis and macromolecular interactions.
- Instrumentation: spectroscopy, microscopy, chromatography, electrophoresis, centrifugation, radioisotope methods and basic data analysis.

Jamia Millia Islamia M.Sc. Biophysics

Official programme facts: M.Sc. Biophysics is offered by the Centre for Interdisciplinary Research in Basic Sciences. The regular programme is four semesters. For 2026–27, programme code M38 is listed for the four-semester route and M78 for the two-semester route available to eligible four-year graduates. The entrance schedule listed a 90-minute test.

Indicative entrance syllabus

JMI's accessible programme and prospectus pages confirm the programme and admission route but do not expose a detailed 2026 topic-by-topic entrance syllabus in the indexed text. The following high-yield outline is aligned with the interdisciplinary eligibility profile and the programme's biophysics orientation; it should be used as a preparation framework, not as a substitute for a later JMI entrance-syllabus notice.

Physics foundations

- Units, dimensions, vectors and error analysis
- Mechanics of particles and fluids; elasticity and viscosity
- Oscillations, waves, sound and optics
- Electrostatics, current electricity and electromagnetism
- Thermodynamics, kinetic theory and introductory statistical physics
- Atomic, quantum, nuclear and radiation physics



Chemistry and biophysical chemistry

- Atomic structure, bonding and intermolecular forces
- Solutions, pH, buffers, ionic strength and colligative properties
- Chemical thermodynamics, equilibrium and kinetics
- Organic functional groups and stereochemistry
- Structure and stability of proteins, nucleic acids, lipids and carbohydrates

Cell and molecular biology

- Cell structure, organelles and membranes
- Membrane transport, diffusion, osmosis and membrane potential
- DNA replication, transcription, translation and gene regulation
- Cell cycle, signalling and apoptosis
- Basic genetics, mutations and inheritance

Biochemistry and physiology

- Enzymes and enzyme kinetics
- Bioenergetics, glycolysis, TCA cycle, oxidative phosphorylation
- Protein, lipid and carbohydrate metabolism
- Nerve, muscle, circulation, respiration and homeostasis

Methods and computation

- UV-visible, fluorescence, IR and basic magnetic-resonance concepts
- Light/electron microscopy and imaging basics
- Chromatography, electrophoresis and centrifugation
- Radioisotope detection and radiation safety
- Graphs, logarithms, elementary probability/statistics and experimental data interpretation

Eligibility snapshot

For M38, the 2026–27 prospectus accepts a three-year B.Sc. in Bio Sciences, Biotechnology, Physics, Chemistry, Mathematics, Computer Science, Material Science or allied sciences, or specified B.Tech. backgrounds, with at least 55%. A non-credit basic mathematics bridge course may be offered to selected candidates who did not study mathematics at 10+2. M78 is the two-semester route for eligible four-year graduates; consult the current prospectus for the complete wording.

Aligarh Muslim University related routes

The official AMU Guide to Admissions 2026–27 contains no programme titled M.Sc. Biophysics. The closest route depends on the candidate's academic direction. Physics is appropriate for a quantitative/physical-science pathway; Biochemistry or Biotechnology is appropriate for molecular and cellular biophysics.



Route A M.Sc. Physics

AMU lists M.Sc. Physics as a two-semester programme for eligible four-year graduates. Selection is through a departmental test consisting of 100 objective questions. Prepare the undergraduate physics core:

- Mathematical physics: vector calculus, matrices, complex variables, differential equations and Fourier methods
- Classical mechanics, central force, rigid body motion and special relativity
- Electricity and magnetism, Maxwell equations and electromagnetic waves
- Oscillations, waves, geometrical and physical optics
- Thermodynamics, kinetic theory and statistical physics
- Quantum mechanics, atomic and molecular physics
- Nuclear physics, radioactivity and detectors
- Solid state physics, semiconductor devices, analogue and digital electronics

Route B M.Sc. Biochemistry

AMU lists M.Sc. Biochemistry as a two-semester programme for eligible four-year graduates, with selection through a departmental test. High-yield preparation areas are:

- Biomolecular structure and function: proteins, carbohydrates, lipids and nucleic acids
- Enzymology, kinetics, inhibition and regulation
- Bioenergetics and intermediary metabolism
- Cell biology, membranes, transport and signalling
- Molecular biology, gene expression and regulation
- Genetics, immunology and basic microbiology
- Analytical biochemistry: chromatography, spectroscopy, electrophoresis, centrifugation and radioisotopes

Route C M.Sc. Biotechnology

AMU's 2026–27 guide specifies one objective paper of 100 questions on Chemistry, Botany, Zoology and Elementary Mathematics. Prepare these four blocks, with extra attention to cell biology, genetics, molecular biology, microbiology, recombinant DNA methods and biotechnology applications.

CUET PG route for Biophysics aspirants

The official CUET PG Science syllabus list for 2026 includes Physics SCQP24 and Life Sciences SCQP17, but no separate Biophysics code. A candidate should select only the paper code accepted by the intended university and programme. Do not assume that both codes are interchangeable.

Physics SCQP24

Paper pattern: 75 compulsory subject-specific questions; bilingual in English and Hindi.

Official unit	Coverage
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Official unit	Coverage
Mathematical methods	Single and multivariable calculus, partial derivatives, Jacobian, differentials, Taylor expansion, Fourier series, vector algebra and calculus, multiple integrals, Green/Stokes/divergence theorems, differential equations, matrices, determinants and complex numbers.
Mechanics and matter	Newtonian mechanics, coordinate systems, rotating frames, central force and gravitation, conservation laws, collisions, rigid-body motion, elasticity and fluid mechanics.
Oscillations waves optics	SHM, superposition, damping, forcing, resonance, wave equation, sound, Doppler effect, lenses, interference, diffraction, resolving power and polarization.
Electricity magnetism	Electrostatics, dielectrics, capacitance, magnetic laws, induction, AC/DC circuits, Maxwell equations, electromagnetic waves and charged-particle motion.
Thermal and statistical physics	Kinetic theory, ideal and real gases, laws of thermodynamics, entropy, Carnot cycle, potentials, phase transitions and classical/quantum distributions.
Modern physics	Relativity, blackbody radiation, photoelectric and Compton effects, atomic models, quantum principles and simple Schrödinger problems, nuclei and radioactivity.
Solid state and electronics	Crystal structure, Miller indices, X-ray diffraction, semiconductors, diodes, BJT, amplifiers, oscillators, operational amplifiers and digital logic.

Life Sciences SCQP17

Paper pattern: 75 compulsory subject-specific questions; bilingual in English and Hindi.

Official unit	Coverage
Techniques	Chromatography, spectroscopy, microscopy, electrophoresis, centrifugation, blotting, PCR and radioisotope techniques.
Chromatin	Prokaryotic/eukaryotic chromosome organization, chromatin types, centromeres, telomeres and gene concept.
Biochemistry	Biomolecules, vitamins, bioenergetics, glycolysis, TCA cycle, electron transport, ATP synthesis, fatty-acid metabolism and membranes.
Biotechnology	Recombinant DNA, cloning, medical/industrial/agricultural applications, cell culture and environmental biotechnology.
Microbiology	Microbial diversity and reproduction, antimicrobials, industrial/agricultural roles, immunity, vaccines, viruses and environmental microbiology.
Molecular genetics	Inheritance, linkage, crossing over, aberrations, extrachromosomal inheritance, replication,



Official unit	Coverage
	transcription, translation, repair and population genetics.
Plant sciences	Major plant groups, vascular system, economic botany, photosynthesis, photoperiodism, vernalization and biogeochemical cycles.
Animal sciences	Animal diversity, human anatomy and physiology, nerve impulses, endocrinology, diseases, apoptosis, cancer and animal cell culture.

Recommended preparation order

1. Start with your confirmed target and paper code. This determines whether physics or life sciences should dominate your schedule.
2. Build the shared base: thermodynamics, biomolecules, cell membranes, spectroscopy, mathematics and data interpretation.
3. For JMI, integrate both sides: solve physics numericals and revise biology/biochemistry concepts every week.
4. For AMU, follow the chosen department's undergraduate core and objective-test format.
5. For CUET PG, use the exact official SCQP24 or SCQP17 headings as a checklist and practise 75-question timed sets.
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