

			<p>Section 6 ; Medicinal Chemistry: Drug-receptor interaction, DNA, Protein, Hormones as receptor, Pharmacokinetics, G-protein coupled receptor, Pharmacodynamics.</p> <p>Section 7 ; Cell biology: Organelles, Cell-Cell interaction, Cell signalling/ trafficking, Cell cycle.</p> <p>Section 8; Drug/ Drug resistance.</p> <p>Section 9; Immunology: Basic immunology .</p> <p>Section 10; Aptitude, Bioinformatics ,Others .</p>
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Ph.D.

Sl. No.	Name of Centre	Sub. Code & Sub. Code Number	Syllabus for Entrance Examination
1	Centre for Molecular Medicine (SCMM)	Molecular Medicine-CMMH (905)	<p>Section A; General Aptitude/Research Methodology Section B; Different Subject Areas of Molecular Medicine Section A</p> <p>Aptitude / Research Methodology Basic Maths ; geometry, statistics, Arithmetics, Log, Basic knowledge of Computer science. Chemistry: Concept of Molarity, Normality, Related to Periodic Table, Organic Chemistry, Synthesis, Thermodynamics, Entropy, Enthalpy, Free energy, Law of Mass action, Reaction kinetics Physics ;Newton's law, radioactivity, Electricity, capacitance, optics, sound, gravity, spectroscopy. Basic Biology; Zoology/Botany - classification/Evolution Biology/Population Biology, General Aptitude and reasoning.</p> <p>Section B Biochemistry: Metabolism, Nutrition, Biomolecules, Hormones, Enzymes, Omics. Microbiology: Bacterial genetics, Antibiotics mode of action, Infectious disease, Industrial Biotechnology. Physiology, Diseases, Pharmacology, Genetics, Molecular Biology, Developmental Biology, Zoology, Population genetics. Botany, Molecular Biology, Advanced Chemistry; Spectroscopy, Molarity/Normality, Radioactivity, Atomic Structure, Acid base, pH. Medicinal Chemistry: Drug-receptor interaction, DNA, Protein, Hormones as receptor, Pharmacokinetics, G-protein coupled receptor, Pharmacodynamics. Cell biology: Organelles, Cell-Cell interaction, Cell signalling/ trafficking, Cell cycle. Drug resistance. Immunology</p>

14. CENTRE FOR THE LAW & GOVERNANCE

The pattern of JNUEE 2020-21 will be based on Multiple Choice Questions (MCQs) through Computer Based Test (CBT)

M.Phil & Ph.D.

Sl. No.	Name of Centre	Sub. Code & Sub. Code Number	Syllabus for Entrance Examination
1	Centre for the Law & Governance (CSL&G)	Law & Governance – CLGP (171) & CLGH (907)	<p>The test will have a 50% weight for social science research methods and 50% weight for domain knowledge covering the disciplines of Economics, Political Science, Sociology, Public Administration, Anthropology, and Law. The questions will be at the level of an advanced Masters and all candidates will be required to attempt questions from all these disciplines.</p> <p>The broad coverage of the subject areas of these disciplines are as follows:"</p> <ul style="list-style-type: none"> Political Science: concept and theories of governance; theories of the State, democracy and development; decentralisation; global governance; politics of identity; multilevel governance; civil society and social capital; neoliberalism and globalisation; social justice; gender, development and governance; and, public administration.

			<ul style="list-style-type: none"> • Law: Constitution and administrative law, criminal law, law and technology, environmental law, corporate laws and labour laws. • Economics: Microeconomics, macroeconomics, development economics, political economy, basic of institutional economics and law and economics with particular focus on transactions costs and property rights, Economic Policy. • Sociology: Sociological Theory, Kinship, Sociological Perspectives on Caste, Gender and Race; Sociology of Law; Culture and Society, Visual Culture. New Social Movements, Urban studies.
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15. SPECIAL CENTRE FOR NANO SCIENCES

The pattern of JNUEE 2020-21 will be based on Multiple Choice Questions (MCQs) through Computer Based Test (CBT)

M.Tech Programme in Nanoscience (NNST-182) & Nanoelectronics (NNET-190)

1	Special Centre for Nano Sciences	Nanoscience – NNST (182)	<p><u>Chemical Sciences:</u></p> <p>Periodic Table and periodicity in properties. Chemical bonding and shapes of compounds, VSEPR theory, lattice energy. Main group elements (s and p blocks). Transition metals and inner transition metals (d and f block). Allotropes. Coordination compounds. Organometallic compounds. Stoichiometry. Acids and bases. Oxidation reduction and precipitation reactions. Radioactivity. Nuclear reactions: fission and fusion.</p> <p>Quantum mechanics. Chemical bonding. Chemical thermodynamics. Kinetic theory of gases. Electrochemistry & Chemical kinetics: Conductance, EMF, Free energy, Nernst equation, redox systems, electrochemical cells, Reactions of various order, Arrhenius equation, Enzyme kinetics, Catalysis. Solutions. Ionic equilibria in solutions, pH and buffer solutions, Hydrolysis, Solubility product, Phase equilibria–Phase rule. Vapour pressure and Osmotic pressure. Molecular weight determination.</p> <p>IUPAC nomenclature. Stereochemistry. Organic reactive intermediates: Generation, stability and reactivity of carbocations, carbanions, free radicals, carbenes, benzyne and nitrenes. Organic reaction mechanisms involving addition, elimination and substitution reactions with electrophilic, nucleophilic or radical species. Common named reactions and rearrangements – applications in organic synthesis. Polymers.</p> <p><u>Physical Sciences:</u></p> <p>Interference. Diffraction. Polarization. Quantum mechanics: Postulates; Wave-particle duality. Commutators and Heisenberg uncertainty principle. Schrödinger equation (time-dependent and time-independent). Exactly- solvable systems: particle-in-a-box, harmonic oscillator and the hydrogen atom. Tunneling through a barrier. Electrostatics: Gauss's law and its applications, Laplace and Poisson equations, boundary value problems. Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction. Scalar and Vector potentials, Maxwell equations. First and second laws of thermodynamics, Thermodynamic functions, Heat capacity, enthalpy, entropy. Bonding in solids, Crystal structures. Bravais lattices. Miller indices. Reciprocal lattice. Bragg's law and applications; Diffraction and the structure factor. Elastic properties, phonons, lattice specific heat. Free electron theory and electronic specific heat. Drude model of electrical and thermal conductivity. Hall Effect and thermoelectric power. Electron motion in a periodic potential, Band theory of solids: metals, insulators and semiconductors. Dielectrics. Ferroelectrics. Magnetic materials. Superconductivity: type-I and type-II superconductors.</p> <p><u>Biological Sciences:</u></p> <p>Biomolecules: Biomolecules (carbohydrates, lipids, proteins, nucleic acids and vitamins). Stabilizing interactions (Van der Waals, electrostatic, hydrogen bonding, hydrophobic interaction, etc.). Biophysical chemistry (pH, buffer, reaction kinetics, thermodynamics, colligative properties). Bioenergetics, glycolysis, oxidative phosphorylation. Catalysis,</p>
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