

NITWET – 2014 INFORMATION BROCHURE

INTRODUCTION

NITWET-2014 (National Institute of Technology Warangal Entrance Test) is a National Level Entrance Test being conducted for admission into various M.Sc. Programmes at NIT Warangal. The admission in these programmes will be based on the Rank obtained in **NITWET-2014/JAM-2014**. Of the total seats in the PG program, 50% of the seats will be filled by JAM-2014 Rank/Score and the remaining 50% will be filled by the Rank obtained in NITWET-2014

NOTE:- Vacant seats reserved for JAM-2014 will be filled by rank obtained in NITWET-2014 as per GOI norms.

Details of the Departments, Programs, Specializations and Eligibility requirements

Department/Program/Specialization

Eligibility

I. Department of Physics

M.Sc. (Tech.) Engineering Physics
(Industry Oriented) with streams of study
in Photonics/ Electronics/ Instrumentation
(3 years – 6 semesters)

B.Sc. degree with Ist class and at least
(i) 60% marks in aggregate in all the
optional subjects put together
or
(ii) Equivalent CGPA 6.5 on a 10 scale
and should have studied Physics, Maths
and any other subject as optionals.

II. Department of Mathematics

M.Sc (Applied Mathematics)
(2 years – 4 semesters)

M.Sc. (Mathematics and Scientific
Computing)
(2 years – 4 semesters)

B.Sc./ B.A. degree with Ist class with
mathematics as main subject and at least
(i) 60% marks in aggregate in all the optional
subjects put together
or
(ii) an equivalent C.G.P.A. 6.5 on a 10 scale

III. Department of Chemistry

M.Sc. Chemistry (Organic Chemistry)
(2 years – 4 semesters)

M.Sc. Chemistry (Analytical Chemistry)
(2 years – 4 semesters)

B.Sc. degree with 1st Class with Chemistry as
the main subject and at least
(i) 60% marks in all the optional subjects put
together
or
(ii) an equivalent C.G.P.A. 6.5. on a 10 scale

Note: SC/ST candidates with 55% marks or with 6.0 CGPA are also eligible to apply for all the above programs.

SUBJECT WISE DETAILED SYLLABII FOR ENTRANCE EXAMINATION (NITWET 2014)

1. For M.Sc. (Applied Mathematics) and M.Sc.(Mathematics and Scientific Computing) programs:

Modern Algebra: Groups-Subgroups-Cosets-Lagrange's Theorem – Cyclic groups – Quotient groups – Homomorphism of groups – Kernel of a group – Permutation groups – Rings – Integral domains – Ideals – Quotient Rings – Fields – Euclidean rings.

Linear Algebra: Elementary transformation – Rank of a matrix – Normal form - system of homogeneous and non-homogeneous linear equations – Eigen values – Eigen vectors – Cayley-Hamilton theorem – Vector space – Subspace – Linear dependence and independence – Span of a set – Basis, Dimension – Linear Transformation – Rank and nullity – Gram-Schmidt orthogonalisation – Quadratic forms.

Mathematical Analysis: Real numbers – Sequences – Series – Tests of convergence – Absolute and conditional convergence – Limits, Continuity and differentiability – Mean value theorems – Taylor's and Maclaurin's expansions – Riemann integration - properties of Riemann integrals.

Vector Calculus: Vector differentiation – Gradient, Divergence and Curl – Line, Surface and Volume integrals – Stokes', Green's and Gauss divergence theorems.

Coordinate Geometry of Three Dimensions: Coordinates – Direction Ratios and Cosines – Angle between two lines – Plane – Angle between planes – Lines – Coplanarity of lines – Shortest distance between two lines – Spheres – tangent planes – Polar planes – Conjugate planes and lines.

Differential Equations: Formation of differential equation – First order and first degree differential equations – orthogonal trajectories – Linear Differential Equations with constant coefficients – Variation of Parameters – Simultaneous differential equations.

2. For M.Sc. (Tech.) Engineering Physics Program:

UNIT - I

Geometrical Optics: Reflection, Refraction at plane and curved surfaces mirrors and lenses. Thin and thick lenses. Combination of lenses. Cardinal points. Unit planes and nodal points. Matrix method in paraxial optics, defects of the images – chromatic, achromatic, monochromatic and spherical aberrations, minimization of spherical aberration, explanation of coma and its elimination, astigmatism and its removal. Optical instruments, vision optics. Dispersion and scattering of light. Velocity of light.

Physical Optics: Huygen's Wave Theory, Coherence, Superposition of waves, Displacement of fringes-phase change on reflection. Interference by division of wave front – division of amplitude. Young's interference, Newton's rings. Michelson interferometer, Fabry perot interferometer. Thin films, interference filters. Diffraction: integral theorem of Helmholtz, Fresnel – Kirchoff's theory of diffraction. Fresnel and Fraunhofer diffraction (Fourier approach). Slit –circular apertures.

Polarization and Double refraction of light – matrix method for polarization analysis, production and detection of polarized light, Nicol prism, Polaroid, Maluslaw – phenomenon of double refraction – mathematical analysis, refraction of a plane wave in a calcite crystal, Waveplates, Compensators, Optical activity, Basics of lasers and Holography.

UNIT - II

Mechanics, Thermodynamics, Electricity & Magnetism: Motion of variable mass systems. Center of mass kinematics, torque, collisions, Centre of mass – Lab reference frames. Motion in uniformly accelerated frames. Inertial forces in non-inertial frames. Euler's equation, conservation laws, steady flow, Bernoulli's equation-applications. Einstein's special theory of relativity – concepts. Damped oscillations, Q-factor, forced oscillations, resonance, mechanical impedance, Coupled oscillators, wave equation.

Laws of thermodynamics, Entropy changes. Thermodynamic potentials. Thermodynamics of low temperatures. Black body radiation. Different fitment formulae. Maxwell-Boltzman, Fermi-Dirac and Bose-Einstein Statistics.

Electrostatics, Magnetostatics, Current. Electricity, Ohm's law, Kirchoff's Laws, Potentiometer, Wheatstone bridge. Capacitance, dielectrics, Ampere's law, Biot-savart Law. Faraday's Laws of electro-magnetic induction. Inductance, Transformer – RC, LC, LR & LCR circuits, Thermoelectricity, Crstal systems, X-ray diffraction, types of magnetism, IH BH curves, Magnetic materials. Maxwell equations and Electromagnetic waves. Hard and Soft super conductors.

UNIT – III

Modern Physics: Photoelectric effect, Compton effect. Uncertainty principle. Atomic spectra, Bohr's theory of hydrogen spectra, Vector atom model. Zeeman and Stark effects. X-rays and its applications. Radio activity and its uses. Nuclear detectors. Particle accelerators. Fission. Fusion. Nuclear reactors. Thermo nuclear reactions, Cosmic rays.

Electronics: Basic electronics, band theory of solids, Conductors, semi conductors and insulators. Intrinsic and extrinsic semi conductors. Hall effect, Fermi levels. Types of PN junction, Junction diode, Zenerdiode, varicap, tunnel diode, metal semiconductor diode, photodiode, PN diode SCR. CE configuration as a two port network, 'h' parameter equivalent circuit, Amplifiers based on frequency ranges. Biasing and load line analysis, thermal runaway, types of feed back. Effect of feedback on gain, noise and band width. Phase shift and weinbridge oscillators. Hartley and colpitts oscillators, crystal oscillators and frequency stability. Relaxation oscialltors. CRT, CRO.

3. For M.Sc. Chemistry (Organic Chemistry) and M.Sc. Chemistry (Analytical Chemistry)

Inorganic Chemistry : s-Block Elements; Group I A, II A, p-Block Elements: Group III B, IV B, V B, VI B, VII B, Group Zero Elements, Metallurgy; d- Block Elements; f-Block Elements; Coordination Compounds; Nuclear Chemistry.

Organic Chemistry: Structure of Organic Molecules; Reactivity of Organic Molecules; Nomenclature of Organic Compounds; Alkanes, Cyclo Alkanes, Alkenes, Alkynes, Arenes, Halogen Compounds, Hydroxy Compounds, Ethers, Carbonyl Compounds, Monocarboxylic Acids and their Derivative; Organic Synthesis based on Carbanions, Nitrogen Compounds, Optical Isomerism, Classification of Natural Amino Acids; Carbohydrates; Heterocyclic Compounds.

Physical Chemistry: Atomic Structure, Chemical Equilibrium; Colloids; Adsorption; Gaseous State; Liquids, Solids, Solutions; Phase Rules; Colligative Properties; Thermodynamics; Electro Chemistry; Chemical Kinetics.

TEST CENTRE : NIT Warangal only

Mode of Entrance Examination and Duration:

There will be 80 objective questions in each subject and the duration of the examination is 2 hours. **4 marks** will be awarded for the correctly answered question and **-1 mark** will be awarded for the wrongly answered question.

Application fee :

1. Application fee is Rs.800/- (Rs.400/- for SC/ST candidates) for each subject.
2. Separate applications are to be submitted for admission to different departments (however only one application is sufficient for different specializations offered by a Department). Applications are to be submitted along with photocopies of necessary certificates and with Demand Draft for Rs.800/- (Rs.400/- for SC/ST candidates) towards the application Fees. D.D. must be drawn in favour of **Director NIT Warangal payable at S.B.H, NIT Warangal Branch (Code No. 20149)** or **SBI, Battala Bazar Branch, Warangal.**
3. Name and address of the candidate should be written on the reverse of the Demand Draft.

Important Information :

1. Candidates awaiting the results of the final semester/year may also apply. But they should submit the final marks list before the date given by the Institute in case they are selected.
2. Candidates should apply for NITWET-2014 through 'Online' at www.nitwet2014.nitw.ac.in