



नैनो प्रौद्योगिकी विभाग  
**Department of Nanotechnology**  
(School of Technology)  
North-Eastern Hill University, Shillong-793 022, Meghalaya

No. 1/NT/Admissions/M.Tech./2017-1

Date: 03/07/2017

**M. Tech. Entrance Examination ( Nanotechnology), ( MEENT- 2017)**

The admissions into the two years M.Tech. course in Nanotechnology will be through the merit and the entrance test to be conducted by the Department. The entrance test will be of two hours duration. Hence, the merit list shall be prepared on the basis of the following:

1. Percentage/ CGPA scored in the qualifying examination (B.Tech/ M. Sc)
2. Marks secured in the entrance examination (MEENT-2017)
3. Weightages given to candidates as per NEHU norms
4. Weightages given to candidates having valid and qualified GATE/NET score. In such cases, weightage given to GATE/NET candidates will be 5.

**The decisions of the admission committee on all matters shall be binding and final.**

**Date , Time and Venue of entrance examination (MEENT-2017)**

Date of written test	21 <sup>st</sup> July'2017, <b>Friday</b>
Duration of the test	Two Hours, ( 10.30 AM to 12. 30 PM)
Venue	Department of Nanotechnology, School of Technology, NEHU, SHillong-22
Reporting Time	9.30AM

***Candidates failing to report on time will disqualify from sitting in the MEENT-2017***

*Applicants should bring the following documents in **ORIGINAL** for verification failing which they shall not be allowed to sit for the MEENT-2017:*

1. Pass certificates of all board/council/University examinations starting from 10th standard.
2. Mark sheets/grade cards of all board/council/University examinations starting from 10<sup>th</sup> standard.
3. Valid SC/ST certificates issued by Deputy Commissioner (DC) or competent authority under the seal of DC's office only.
4. Permanent Resident Certificates for those who are claiming the permanent resident of Meghalaya.
5. Any other certificates in support of your application, if applicable.
6. GATE score card (if qualified).

**Sd/-**

**Chairman, Admissions Committee,  
(Department of Nanotechnology)**



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**Syllabus for  
M.Tech. Entrance Examination (Nanotechnology), (MEENT-2017)**

**Numerical Analysis :** Differentiation, Integration, introduction to sampling and sampling distributions like Chi-square, t and F distributions, test of significance based on t, Chi-square and distributions, Matrices : Rank of Matrix, Eigen Values and Eigen Vectors, Inverse of a Matrix, Newton Raphson method, Euler method, Runge Kutta. (20)

**Electrical Properties of matter :** Semiconductors, Concept of energy band diagram for materials - conductors, semiconductors and insulators, electrical conductivity effect of temperature on conductivity, intrinsic and extrinsic semiconductors, dielectric properties. Carrier transport in silicon: diffusion current, drift current, mobility, and resistivity. Generation and recombination of carriers, Types of diodes, LEDs, Inductors, Resistors, Capacitors, Ohm's law, Gauss's Theorem, Ampere's Circuital Law, Digital Electronics, Boolean Algebra, Logic Gates, Combinational and Sequential Circuits, Flip-Flops, Counters. (20)

**Biotechnology:** Cell biology, Tissues, Cellular organelles: Structural organization of Plasma membrane, cell wall, Mitochondria; Structure of DNA and its physico-chemical properties. Prokaryotic and eukaryotic DNA replication- DNA polymerases and proteins involved in DNA synthesis and their specific roles. Transport of nutrients, ions and macromolecules across membranes; Basic concepts in immunology, cells of immune system, innate and acquired immunity, clonal nature of immune response; Organization and structure of lymphoid organs. (20)

**Properties of Materials:** Atomic structure- Atomic bonding in solids- Crystalline state of solids- Unit cells and Space lattices – Crystal structures- Crystal planes and directions- Miller Indices - Diffraction of X-rays by crystal - Bragg's equation - Correction to Bragg's equation - Reciprocal lattice- Crystal Defects- point, line and surface defects. Plastic deformation - Slip - twinning - Critical resolved shear stress - theoretical shear strength of perfect crystal - role of dislocation in plastic deformation - methods of strengthening crystalline materials - strain hardening - grain size - solid solution strengthening - precipitation strengthening - fibre reinforced materials - whiskers - creep - creep curves - mechanism of creep - creep resistant materials. Ductile and brittle fracture - Theoretical cohesive strength of materials - Griffith's theory - Methods of protection against fracture - Fatigue. (20)

**Wave properties of particles:** Schrödinger's equation, Postulates of quantum mechanics, operators, expectation values, applications to particle in a (one and three dimensional) box, harmonic oscillator, Square Well, step potential, potential barrier. Hydrogen atom, natural occurrence of  $n$ ,  $l$  and  $m$  quantum numbers, related physical quantities, Bohr's theory. (20)



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**Important Dates:**

Publication of Shortlisted Candidates for Entrance Test (MEENT-2015)	12 <sup>th</sup> July'2017 , Tuesday
Date of M.Tech. Entrance Test	21 <sup>st</sup> July'2017
Publication of Merit List	27 <sup>th</sup> July'2017
Date of Admission	8 <sup>th</sup> August'2017
Date of Admission for waiting list (if any)	9 <sup>th</sup> August'2017
Commencement of Classes	11 <sup>th</sup> August' 2017

*Note: The above mentioned dates are tentative.*

**Sd/-**  
**Chairman, Admissions Committee,**  
**(Department of Nanotechnology)**