

Department of Information Technology
School of Technology
North Eastern Hill University, Shillong- 793022

Ph.D. in IT Entrance Examination (EE) 2017

The admission/selection in the PhD program for a limited number of seats will be done on the basis of a written test (Please refer to the detailed syllabus) of one and half hour duration (total marks 50) followed by a personal interview (PI) (total marks 50). Merit list shall be prepared as per NEHU rules and based on the performance in EE and PI.

The decision of the admission committee in all matters shall be binding and final. Date, time and venue of the written test as well as personal interview are as follows:

Date of written Test and Interview	11 th July 2017 (<i>May continue to the next day, if not completed on the same day</i>)
Time of written Test	10.30 AM – 12PM
Time of interview	2 PM onwards
Venue	Department of Information Technology, School of Technology, NEHU, Shillong 793022
Reporting Time	8:45AM (at the venue) Document verification will start from 9:00 AM

In case, any candidate fails to report at the reporting time and venue on the specified date and time mentioned above, he/she will forfeit his/her claim to appear for entrance test and Interview.

You are further informed to bring the following documents in **ORIGINAL** for verification failing which your selection for entrance test and interview will stand cancelled:

1. Pass certificate of Degree in relevant discipline.
2. Pass certificates of all board/council/University examinations starting from HSLC or equivalent.
3. Mark sheets/grade cards of all board/council/University examinations starting from HSLC or equivalent.
4. Valid certificate for SC/ST issued by Deputy Commissioner (DC) or competent authority under the seal of DC's office only.
5. Permanent Resident Certificate for those who are claiming the permanent resident of Meghalaya.
6. Date of Birth Certificate or HSLC certificate.
7. No Objection Certificate from Employer as per format approved by NEHU Authority(**In case of Employment**).

Sd/-

Chairman

PhD (IT) Admission Committee 2017

The detailed syllabus of written test for PhD Entrance Examination-2017

Mathematical Foundation

Algebra: Matrices, Rank of Matrix, Eigen Values and Eigen Vectors-Inverse of a Matrix, Laws of set theory, partitions, permutation and combination, Functions, Relations, properties of relations, closure operations on relation.

Number Theory: Divisibility, Greatest Common Divisor, Fundamental Theorem of Arithmetic, Modular Arithmetic, Arithmetic with a Prime Modulus.

Calculus: Limit and continuity, differentiability of functions, successive differentiation, integration and properties of definite integrals.

Mathematical Logic & Proofs: Truth table, principles of counting, recurrence relations, Sets, Relations, Propositional Logic and Predicate Logic, Proposition, Induction, Proof by Cases, Proof by Contradiction.

Probability & Statistics: Introduction to probability, Bayes theorem, random variables and probability distributions and density functions, binomial Poisson and normal distributions and their properties, correlation and regression, method of least squares, introduction to sampling and sampling distributions like Chi-square, t and F distributions, test of significance based on t, Chi-square and F distributions.

Data Structure & Algorithm

Linear Data Structures- List, Stack, Queue, Non-linear Data Structure- Representation of Tree, Binary Trees, Tree traversals, Binary Search Tree, AVL Tree, Graphs, Sorting and Searching, Hashing, B & B+ Tree.

Classification of Algorithms, Complexity, Asymptotic Notations, Dynamic Programming, Greedy Algorithm, NP- Problems, Amortized Analysis, Master Theorem, Probabilistic Analysis: Sort, Search, Random Binary Search trees.

Computer System & Programming

Programming in C, User Defined Functions and Library Functions, Local and Global Variables, Parameter Passing, Pointers, Arrays, Strings, C Preprocessors, Structures.

Number system, Boolean Expression, Instruction, Central Processing Unit, Memory, I/O devices.

Theory of Computation, Regular Grammars, Formal Grammars & Language, Turing Machines & Pushdown Automata

Process and threads, Mutual exclusion, Semaphores, Deadlock, Memory management requirements, Virtual memory, scheduling algorithms.

ISO/OSI Model, TCP/IP Model, Multiple access protocols, IEEE 802.X LANs and MANs-Ethernet, Token Ring, Token Bus, TCP and UDP.