

NOTIFICATION

For Ph.D. Entrance Examination in ECE (PEnE-E) - 2020

The admission/selection in the PhD programme for a limited number of seats shall be done on the basis of a **written test** (please refer the detailed syllabus at page 2) of one-hour duration (marks: 70%) followed by a **personal interview** (PI) (marks: 30%). Merit list shall be prepared as per NEHU rules: RC-23 clause 2(vi)C.

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 the personal interview are as follows:

Date of written test:	October 19, 2020 (Monday)
Mode of examination:	Online
Time of written test:	11:30 am to 12:30 PM
Date of personal interview:	October 20 & 21, 2020
Time of personal interview:	11:30 am onwards

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

Notes:

- 1. The above-mentioned dates are tentative. In case of any changes of the dates, same will be notified in the NEHU website.*
- 2. All qualifying candidates will be provisionally admitted.*
- 4. Qualifying candidates need to provide an undertaking mentioning that he/she will forfeit the claim against his/her candidature if not satisfying the desired criteria supported by all original testimonies.*
- 5. The qualifying candidates decided to take admission will have to pay their fees before 6th November, 2020 failing which their admission will stand cancelled.*
- 6. Only candidates qualified in the written test examination will be called to appear for personal interview.*
- 7. Physical verification of the original Mark sheets, Certificates, Testimonies etc. will be done after re-opening of the department with regular normal classes. If any qualifying candidates is found to be not fulfilling the desired criteria, his/her admission will stand cancelled and the admission fees will be returned to the concerned student after deducting the processing fees as per the rule of University.*

Sd/-

**Chairman,
PhD (ECE) Admission Committee 2020**



Syllabus for Ph.D. Entrance Examination in Electronics & Communication Engineering (PEnEE-2020)

Part – I

(a) Introduction to Research Methodology: Meaning, Objectives, importance, types, Approaches, Characteristics of Scientific Method, Criteria of Good Research.

(b) Problem Identification & Formulation: Defining and formulating the research problem, Problem identification process; Components of the research problem; Formulating the research hypothesis; Writing a research proposal.

(c) Reviewing the literature: Searching the existing literature, reviewing the selected literature, Identifying gap areas from literature review, Development of working hypothesis.

(d) Research Design: Meaning & Need, Features of a Good Design, Important Concepts Relating to Research Design.

(e) Data Collection and Analysis: Collecting data, Methods of data collection, Data Preparation, Data Processing, Hypothesis testing.

(f) Research Report Writing: Types of research reports – Brief reports and Detailed reports; Report writing: Structure of the research report- Preliminary section, Main report, Interpretations of Results and Suggested Recommendations; Report writing: Formulation rules for writing the report: Guidelines for presenting tabular data, Guidelines for visual Representations.

(g) Use of Tools/Techniques for Research: Methods to search required information effectively, Reference Management Software like Mendeley/Zotero; Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism.

(h) Quantitative Techniques and Mathematical Modelling: Quantitative research – Concept of measurement, causality, generalization. Vector spaces - norms - Inner Products - Eigen values using QR transformations. Numerical Computing, Solutions of equations in one variable, Polynomial equations and Transcendental equations, Bisection Methods, False Position method, Newton-Raphson Method, Secant Method etc. Conditional probability, independence and Bayes theorem, continuity property of probabilities; random variable: probability distribution, density and mass functions, functions of a random variable; expectation, characteristic and moment-generating functions; joint distribution and density functions.

(h) Ethics in Research: Meaning of Research Ethics; Clients Ethical code; Researchers Ethical code; Ethical Codes related to respondents; Responsibility of ethics in research.



Part – II

(i) Electronics Fundamentals:

Physics of semiconductors, diodes, BJT, FET and their applications; op-amps and oscillators with their applications.

(j) Digital Electronics & Microprocessors:

Number systems, logic gates, combinational & sequential circuits; basic of microprocessors, architecture & assembly language programming of 8085 microprocessor.

(k) Analog Communication Systems:

Linear modulation & demodulation: time domain expression & frequency domain spectra of AM, DSB-SC, SSB-SC, VSB; power & bandwidth. Angle Modulation: Representation of FM and PM Signals, Spectral Characteristics of AM and Angle-Modulated Signals.

(l) Digital Communication Systems:

Sampling and quantisation, frequency domain signal representation, Signal coding Techniques (Pulse digital modulation): digital modulation schemes: amplitude, phase and frequency shift keying schemes (ASK, PSK, FSK), Basics of TDMA, FDMA and CDMA, Fundamentals of information theory and channel capacity theorem.

(m) Signal Processing:

Sampling theorem. Linear Time-Invariant (LTI) Systems: definitions and properties; causality, stability, impulse response, convolution, poles and zeros, parallel and cascade structure, frequency response, group delay, phase delay. Signal transmission through LTI systems. Continuous-time and discrete-time Fourier Transform, DFT and FFT. Filter Design- analog and digital IIR and FIR filters. Multirate, Filter banks.

(n) EM Theory, Microwave and Antenna:

Maxwell's equations: boundary conditions, wave equation; Plane waves and properties: reflection and refraction, polarization, phase and group velocity, propagation through various media, skin depth; Transmission lines: equations, characteristic impedance, impedance matching, S-parameters, Smith chart; Waveguides: modes, boundary conditions, cut-off frequencies; Antennas: antenna types, radiation pattern, gain and directivity, antenna arrays.



PATTERN OF TEST PAPER (30 Questions)

15(Fifteen) questions out of 20 to be answered from each of Part – I and Part – II.

The test paper shall be of multiple choice type questions (MCQ). Each question shall have four choices as possible answers, of which, only **one** will be correct. Each question carries **2 (two)** marks.

Maximum Number of Seats Available:

<i>Sl No</i>	<i>Area of Specializations</i>	<i>No of Seat Available</i>
1	Signal Processing & its Applications	4
2	Communication Systems	6
3	Microwave & Antenna	2
4	Control System	2
5	AI & ML	2

Instructions to Candidates:

- Use of unfair means by a candidate in written test, whether detected at the time of test, evaluation or at any other stage, will lead to cancellation of his/her candidature as well as disqualification of the candidate from appearing in written test in future.
- Candidates are advised to check their email id (*given in their application form*) and the NEHU website on regular basis for any update.

Sd/-

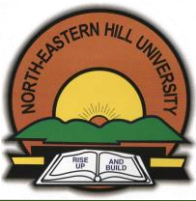
**Chairman,
PhD (ECE) Admission Committee 2020**



List of Applicants Called for Written Test

The following applicants have found satisfying the eligibility criteria of the department and are called for written test examination:

Sl No	Form No	Name of Candidates
1	20100008-I	Abinash Thakur
2	20100811	Kishore Kanti Chakraborty
3	20100075	Kumari Pammi
4	20100098	Hubha Saikia
5	20100135	Debabrata Gogoi
6	20100211	Eeshant Kumar Chettry
7	20100217	Debarun Chakraborty
8	20100236	Krishna Sarma
9	20100355	Beauty Debbarma
10	20100377	Shyamal Mandal
11	20100480-I	SRINIVASA RAO YANDRAPU
12	20100498-I	MOHAN KUMAR Kumar
13	20100499-I	KOTA RAVI KUMAR
14	20100535	Reema Das
15	20100569	Pritam Bhagwan Salwe
16	20100629	PARTHA PRATIM CHAKRABORTY
17	20100661	Siddhartha Sankar Deb
18	20100711	Samar Jyoti Hazarika
19	20100713-I	Fidalizia Pyrtuh
20	20100758-I	SHUBHRA ARYA
21	20100780	Priyanka Hazowary
22	20100785	Bibek Mishra
23	20100786	Wandarisa Sungoh
24	20100802	Rameez Raja Gazi
25	20100803-I	BHANITA Adhikary
26	20100808	DIMPEE DAS
27	20100814	Khiakupar Jyndiang
28	20100815	Mainkordor Mawblei
29	20100818	Amardeep Kumar Thakur



List of Ineligible Candidates

The following applicants have been found to be ineligible for unsatisfying the eligibility criteria of the department

Sl No	Form No	Name of Candidates
1	20100007	Ankuman Boruah
2	20100025	Lubna Ikram
3	20100038	NOUSHAD KP
4	20100051	Bawandakmen Lyngdoh
5	20100068	Shilpa Saha
6	20100077	Anindita hazarika
7	20100095	Ferdinand Rani
8	20100099	RASHMI MISHRA
9	20100104	Zubeni N Ngullie
10	20100109	Sevika Debbarma
11	20100241-I	Anamika Bhattacharjee
12	20100253	Onessimos Shangdiar
13	20100255-I	Amulya Kumar Behera
14	20100258	RAHUL KUMAR MEENA
15	20100279-I	Anushree Panigrahi
16	20100286-I	DAKAHI PR RABON
17	20100325-I	Balaji Kondiba More
18	20100331	Rana Roy
19	20100335	PONGKI Bora
20	20100339	Rekha Kumari Sharma
21	20100340	TRIPURARI SHARAN
22	20100341	KASERUDDIN Ahmed
23	20100343	Gwmsath Mushahary
24	20100361	Debabrat Senapati
25	20100372	Jaya Pal
26	20100382	Deiborme Lyngdoh
27	20100394-I	NIENGJOLLY GANGTE
28	20100399	Diganta Daimary
29	20100402	Daniel Hudson Haokip
30	20100412-I	Goutham k s
31	20100415-I	PRANGAN Kumar LAHKAR
32	20100431	Doreena mili Warjri
33	20100437	saumya Rai
34	20100462-I	Pankaj Sonari
35	20100463	Ajit Kumar
36	20100489-I	BADAHUN MARY RYMBAI
37	20100490	GANESH CHANDRA DAS
38	20100512-I	Preeti Sharma
39	20100519	POMPI Dihingia



इलेक्ट्रॉनिकी एवं संचार अभियांत्रिकी विभाग
पूर्वोत्तर पर्वतीय विश्वविद्यालय
स्थायी परिसर, शिलांग - ७९३ ०२२ (मेघालय)
Department of Electronics & Communication Engineering
North-Eastern Hill University
Permanent Campus, Shillong – 793 022 (Meghalaya)

40	20100523	Shelee Barman
41	20100559	BIJUTA MUSHAHARY
42	20100562-I	Kumari Chandni
43	20100574	BIPLAB DHARA
44	20100581	Surjeet Kumar Gurung
45	20100588	Prarthina Deuri
46	20100590-I	Ankit Kumar Dash
47	20100591-I	RINKU MONI PHUKON
48	20100592	C Lalruatkimi
49	20100595-I	Prerna Mukhia
50	20100598	Usha Thakuria
51	20100603	Labamaryca Tariang
52	20100606-I	Anisha A
53	20100608-I	Sushma X
54	20100620-I	Pallabi Dutta
55	20100622-I	Dawa lhamu Bhutia
56	20100626	Kajal Sharma
57	20100627-I	Mery Boko
58	20100634-I	Daioohiaka Shylla
59	20100656	Pratap Ranjan Das
60	20100670	Bikesh Kumar Tiwari
61	20100681-I	JYOTI GOGOI
62	20100685	YMJULETTY BASARINGAID
63	20100687-I	RAKESH Bag
64	20100688	SUMI Kalita
65	20100695	Baris Biswas
66	20100726	Mridul Roy
67	20100761-I	Yanthungo Yanthan
68	20100765	LARISA Nongspung
69	20100769-I	sophio riphung
70	20100793	Sheriza Japhia Nonglait
71	20100795	Asha Kumari Rai
72	20100799-I	BANDANA Yumnam

Sd/-

Chairman,
PhD (ECE) Admission Committee 2020