

ADMISSION NOTIFICATION FOR M.TECH. (ENERGY ENGINEERING)

2020-21



Assam Science and Technology University

Tetelia Road, Jalukbari, Guwahati – 781013, Assam, India

<https://astu.ac.in/>

1. DEPARTMENT OF ENERGY ENGINEERING

Department of Energy Engineering is the first in-campus department of the Assam Science and Technology University (ASTU) started in 2016 with the objectives to develop technically competent human resource and environmentally benign sustainable technologies in energy sector. This department focuses on establishment of a research platform to carry forward R&D activities in distinguished fields of renewable energy. Establishment of Energy Engineering department in the university is a part of initiative to develop a roadmap for research to solve energy and environment related relevant engineering and technological challenges. This is in accordance with IMPRINT INDIA's (Government of India's scheme launched on 5th November 2015) aim of directing research in the premier institutions into areas of societal relevance. The department is offering M.Tech (Energy Engineering) from academic session 2016-17.

Major Thrust Areas:

Solar Energy, Bioenergy, Renewable and Alternate Energy Technologies, Fuel Technology, Energy Conservation and Management, Fusion Energy, Energy Modeling & Simulation Study, Waste to Energy Conversion, Environment and climate change study etc.

Course Curriculum:

M.Tech (Energy Engineering) course in the Department of Energy Engineering of ASTU is approved by All India Council for Technical Education (AICTE). The course curriculum is developed based on the guidelines of AICTE Model curriculum for Postgraduate Degree in Engineering and Technology, January 2018:

Course Type	No. of Courses	Total Credits
1. Core Course (CC)	04	12
2. Program Specific Elective (PE)	05	15
3. Lab Course (LC)	04	08
4. Research Methodology and IPR	01	02
5. Open Elective (OE)	01	03
6. Mini Project	02	02
7. Dissertation	02	26
(Phase-I & Phase II)		
8. Audit Course (AC)	02	00

Semester wise courses for M.Tech (Energy Engineering)

Course code	Name	Scheme of Studies Per Week L- T - P	Credits C
Semester-I			
EECC18101	Foundation for Energy Engineering	2-2-0	3
EECC18102	Solar and Bio Energy Technologies	2-2-0	3

EECC18103	Energy System Modeling& Optimization	2-2-0	3
EEPE181xx	Elective I	3-0-0	3
EELC18101	Energy Lab-I	0-0-4	2
EELC18102	Energy Lab-II	0-0-4	2
EERM18101	Research Methodology and IPR	2-0-0	2
EEAC18-0x	Audit Course 1	2-0-0	0
Total			18
<u>Semester-II</u>			
EECC18201	Alternative Energy Technologies	3-0-0	3
EEPE182xx	Elective-II	3-0-0	3
EEPE182xx	Elective-III	3-0-0	3
EEPE182xx	Elective -IV	3-0-0	3
EELC18201	Energy Lab-III	0-0-4	2
EELC18202	Energy Lab-IV	0-0-4	2
EEMP18201	Studies with Community MINI PROJECT	0-0-4	1
EEMP18202	Factory/Industry/Site Visit [MINI PROJECT]	0-0-4	1
EEAC18-0x	Audit Course 2	2-0-0	0
Total credits			18
<u>Semester-III</u>			
EEPE1830x	Elective -V	3-0-0	3
EEOE18-0x	Open Elective	3-0-0	3
EED18P-I	Dissertation Phase – I	0-0-20	10
Total Credits			16
<u>Semester-IV</u>			
EED18P-II	Dissertation Phase – II	0-0-32	16
			16

Open Elective (EEOE18-0x)

1. EEOE18-01 Business Analytics
2. EEOE18-02 Industrial Safety
3. EEOE18-03 Operations Research
4. EEOE18-04 Cost Management of Engineering Projects
5. EEOE18-05 Composite Materials
6. EEOE18-06 Waste to Energy

Audit course 1 & 2 (EEAC18-0x)

1. EEAC18-01 English for Research Paper Writing
2. EEAC18-02 Disaster Management
3. EEAC18-03 Sanskrit for Technical Knowledge
4. EEAC18-04 Value Education
5. EEAC18-05 Constitution of India
6. EEAC18-06 Pedagogy Studies
7. EEAC18-07 Stress Management by Yoga

Program Specific Electives (PE)

Elective-I

EEPE18101	Energy Scenario and Energy Policy
EEPE18102	Energy and Society
EEPE18103	Energy Economics and Planning
EEPE18104	Electricity Regulations and Reforms in India

Elective-II

EEPE18201	Environmental Science and Engineering
EEPE18202	Energy, Ecology and Environment/
EEPE18203	Energy, Environment and Climate Change (including carbon trade)

Elective-III

EEPE18204	Electrical and Mechanical Energy Utility Systems
EEPE18205	Power Plant Engineering
EEPE18206	Decentralized Energy Systems
EEPE18207	Instrumentation and Control for Energy Systems
EEPE18208	Power Generation and System Planning
EEPE18209	Energy Conservation and Waste Heat Recovery
EEPE18218	Project Management

Elective-IV

EEPE18210	Fuel & Combustion Technology
EEPE18211	Energy Generation from Waste
EEPE18212	Alternative Fuels for IC Engine
EEPE18213	Energy Storage System
EEPE18214	Energy Efficient Building
EEPE18215	Renewable Energy Grid Integration
EEPE18216	Energy Audit and Management
EEPE18217	Hybrid Renewable Energy Systems Design
EEPE18219	Vacuum Technology

Elective-V

EEPE18301	Fuel Cells and Hydrogen Energy
EEPE18302	Hydro Power Management
EEPE18303	Advanced Solar Thermal and PV
EEPE18304	Wind Power Technology
EEPE18305	Solar Thermal Technology
EEPE18306	Bioenergy Technology
EEPE18307	Solar Photovoltaic Technology
EEPE18308	Petroleum Production & Refining

EEPE18309	Industrial Plasma Technology
EEPE18310	Nuclear Energy Engineering
EEPE18311	Hybrid Renewable Energy Systems Design

2. APPLICATION FOR ADMISSION

Assam Science and Technology University, Guwahati, invites application for admission in M.Tech (Energy Engineering) for the session 2020-21. Eligible Candidates may apply either based on valid GATE score or through Assam Science and Technology University Entrance Examination (ASTUEE-2020).

Considering the pandemic situation prevailing in the country by the spread of COVID-19, Applications are invited **only through email** (to head.ee@astu.ac.in) from the eligible and suitable candidates **in prescribed format along with supporting documents** for admission in M.Tech (Energy Engineering) for the academic session 2020-21.

Filled in Application form along with the supporting documents (as mentioned in *Section 6.1*) should reach to head.ee@astu.ac.in on or before **12:00 AM, 18 July, 2020**.

3. ADMISSION

Intake Capacity: 18 Students

The University reserves the right increase or decrease student intake in the programme.

4. ADMISSION PROCEDURE/ELIGIBILITY CRITERIA

1. BE/B.Tech in Chemical/ Mechanical/ Electrical/ Energy Engineering/ Electronics/ Instrumentation/ Agricultural Engineering or M. Sc. in Physics and Chemistry with a minimum of 50 % marks (45% for ST and SC) in aggregate (or equivalent CGPA). Candidates awaiting for last semester BE/B.Tech/M.Sc results in the above mentioned branches may also apply, but will have to submit the required documents within a stipulated period to be specified by the selection committee.
2. Candidates with valid GATE score in the above-mentioned branches will be preferred and admitted on merit basis (as per GATE rank).
3. The remaining vacant seats will be filled up through the university entrance examination (ASTUEE-2020)
4. Statutory Reservation and Relaxation Policy shall be followed as per the Government of Assam Rules.
5. The list of selected candidates for counseling/admission will be notified in the university website: <https://www.astu.ac.in/>
6. The selected candidates must have to produce the original testimonials and certificates (as mentioned in *Section 6.2*) at the time of counseling/admission.
7. For any clarification, queries may be sent to: head.ee@astu.ac.in

5. IMPORTANT DATES

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|---|-----------------------------|
| • Opening of the application submission process | 24 June, 2020 |
| • Closing Date of application submission | 18 July, 2020
(12:00 AM) |
| • Declaration of Merit & Waiting list for GATE qualified applicants | 24 July, 2020 |
| • Counseling/Admission of GATE qualified applicants | 30 July, 2020 |
| • Issuance of admit card for the entrance examination starts | 31 July, 2020 |
| • Date of Entrance Examination | 08 August, 2020 |
| • Declaration of merit & waiting lists for the shortlisted/selected applicants from entrance exam | 13 August, 2020 |
| • Counseling/Admission of entrance exam qualified applicants | 19 August, 2020 |
| • Commencement of classes for the new session | 24 August, 2020 |

6. HOW TO APPLY

Interested candidates may submit the filled-in application form after downloading from ASTU website <https://astu.ac.in/on> or before **last date of submission of the application process (12:00 AM, 18th July, 2020)**

Candidates are advised to read the instructions for filling up the application form. The applicants must possess required criteria and educational qualification as mentioned in ADMISSION PROCEDURE/ELIGIBILITY CRITERIA, failing which candidature shall be disqualified at the time of counseling.

6.1. Documents to be uploaded with the application form:

1. Copies of BE/B.Tech/M.Sc. Certificate & Marksheet
2. Candidates waiting for last semester BE/B.Tech/M.Sc results will have to submit the proof of last examination passed
3. Copy of the valid GATE score card (for GATE qualified candidates only)

6.2. Documents to be produced at the time of counseling/admission:

1. High School Leaving (10th standard) Certificate & Marksheet
2. HS (10+2 standard) Certificate & Marksheet
3. BE/B.Tech/M.Sc. Certificate & Marksheet
4. Candidates waiting for last semester BE/B.Tech/M.Sc results will have to submit the proof of last examination passed, proof of no running backlog in the previous semester examinations and evidence of appearing in the last semester examination.
5. Valid GATE score card
6. The relevant certificate issued by the competent authority, if seeking admission under any reserved category as mentioned
7. Permanent Residence Certificate (PRC) of Assam issued by the competent authority

8. Sponsorship/No Objection Certificate issued by the employer, if the candidate is employed.

6.3.Application Fee

The Application Fee is Rs. 500/- (Five Hundred only). **However, this fee has been waived off (for the session 2020-21) for the students domicile from Assam as per the Government of Assam guidelines in relation to the situation arising out of COVID 19. Therefore, the students domicile from Assam need not to pay any application fee for Admission in M.Tech (Energy Engineering) for the session 2020-21.**

7. IMPORTANT INSTRUCTIONS TO CANDIDATES

- **Applicants need not to send the hard copy of Application Form or any Document to this office. However, candidates should take printout of the application form to be produced during counseling.** Please note that if any mistake is detected after submission of Application, it cannot be rectified by the University.
- The candidates must carry the original photo id proof which has been mentioned in the application, at the time of written test for verification.
- Applicants are required to submit the scanned copies of the supporting documents (as mentioned in *Section 6.1*) with the application form.
- Application once submitted cannot be altered/resubmitted, under any circumstances. Further, no request with respect to making changes in any data/ particulars entered by the candidate in the Application will be entertained, once the application is submitted successfully.
- Request for change of mailing address or e-mail address or Mobile No. during the process of admission will not be entertained under any circumstances. The university authority will not be responsible for any loss of e-mail, loss of any communication due to wrong address provided by the applicants.
- No TA/DA and accommodation shall be provided for attending Written Test, counseling and interviews for admission in the course.
- Errors and omissions in notification and admission process are subject to corrections as per rules.
- Candidates are suggested to furnish the correct information in the application form. Applications with incorrect information will be summarily rejected.
- Canvassing in any form may disqualify the candidature of the applicant.
- The selected candidates must have to produce the original testimonials and certificates (as mentioned in *Section 6.2*) at the time of counseling/admission.
- For any clarification, queries may be sent to: **head.ee@astu.ac.in**

PATTERN OF ENTRANCE EXAMINATION

- Date of Entrance Examination: 08 August, 2020
- Time for Entrance Examination: 11.00 am – 01.00 pm

Syllabus:

Section 1: Engineering Mathematics (10 questions each carrying 1 marks)

Linear Algebra: Matrix algebra, Systems of linear equations, Eigen values and eigenvectors.

Calculus: Functions of single variable, Limit, continuity and differentiability, Taylor series, Mean value theorems, Evaluation of definite and improper integrals, Partial derivatives, Total derivative, Maxima and minima, Gradient, Divergence and Curl, Vector identities, Directional derivatives, Line, Surface and Volume integrals, Stokes, Gauss and Green's theorems.

Differential equations: First order equations (linear and nonlinear), Higher order linear differential equations with constant coefficients, Cauchy's and Euler's equations, Initial and boundary value problems, Laplace transforms, Solutions of one dimensional heat and wave equations and Laplace equation.

Complex variables: Complex number, polar form of complex number, triangle inequality.

Probability and Statistics: Definitions of probability and sampling theorems, Conditional probability, Mean, median, mode and standard deviation, Random variables, Poisson, Normal and Binomial distributions, Linear regression analysis.

Numerical Methods: Numerical solutions of linear and non-linear algebraic equations. Integration by trapezoidal and Simpson's rule. Single and multi-step methods for numerical solution of differential equations.

Section 2: General knowledge and current affairs on energy and environment (10 questions each carrying 1 marks)

Section 3: Technical Questions (30 questions each carrying 1 marks)

Basics of energy: Different forms of energy, energy conversion process, indirect and direct energy conversion; Different energy sources; Conventional energy systems: engines, power plants, various methods of power generation;

Basics of Thermodynamics: Laws of thermodynamics and applications

Heat Transfer Operations: Heat Transfer by Conduction, Convection (natural & forced convection), Radiation, Boiling, Condensation, Evaporation, Basics of Heat transfer equipment, Heat Exchangers

Fluid Mechanics: Fluid flow phenomena, Basic equation of fluid flow, Flow of incompressible fluid in conduits, conservation equations for mass, momentum and energy; Uses of non-dimensional numbers to describe flow conditions; Theory and principles of flow measuring devices; Viscous flow in a pipe, Flow through packed and fluidized bed

Electrical Machines: Principles of Transformer, motor and generators, characteristics and applications; DC machines: characteristics and applications