



ADMISSION NOTIFICATION FOR M.TECH. (ENERGY ENGINEERING) 2024-25

Assam Science and Technology University (ASTU)
Tetelia Road, Jalukbari, Guwahati, Assam 781013

1. DEPARTMENT OF ENERGY ENGINEERING

Department of Energy Engineering is the first in-campus department of 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, Biomass Conversion Technologies, Advanced Biofuel Technologies, Fuel Technology, Bio- & Thermo-chemical conversion Technologies, Solar Photovoltaic Conversion, Solar Thermal Conversion, Other Renewable Energy Technologies, Energy Conservation and Management, Energy Modeling & Simulation Study, Fusion Research, 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:

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 (Phase-I & Phase II)	26
8. Audit Course (AC)	02	00

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
MAC20211x	Audit Course 1	2-0-0	0
Total			18
Semester-II			
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
MAC20211x	Audit Course 2	2-0-0	0
Total credits			18
Semester-III			
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
Semester-IV			
EED18P-II	Dissertation Phase - II	0-0-32	16
Total			16

Semester wise courses for M.Tech (Energy Engineering) Open Elective (EEOE18-0x)

- EEOE18-01 Business Analytics
- EEOE18-02 Industrial Safety
- EEOE18-03 Operations Research
- EEOE18-04 Cost Management of Engineering Projects
- EEOE18-05 Composite Materials
- EEOE18-06 Waste to Energy

Audit course 1 & 2

MAC202111	English for Research Paper Writing
MAC202112	Disaster Management
MAC202113	Sanskrit for Technical Knowledge
MAC202114	Value Education
MAC202115	Constitution of India
MAC202116	Pedagogy Studies
MAC202117	Stress Management by Yoga
MAC202118	Personality Development through Life Enlightenment Skills

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 2024-25. Eligible Candidates may apply either based on valid GATE (Graduate Aptitude Test in Engineering) score or through Assam Science and Technology University Entrance Examination (ASTUEE-2024). Interested candidates may submit application online by filling up & uploading the required documents in [APPLY ONLINE](#)

3. ADMISSION

Intake Capacity: 18 Students.

4. ADMISSION PROCEDURE/ELIGIBILITY CRITERIA

- BE/B.Tech in Chemical/ Mechanical/ Electrical/ Energy / Electronics/ Instrumentation/ Agricultural Engineering and other relevant disciplines with a minimum of 50 % marks (45% for ST and SC) in aggregate (or equivalent CGPA). Candidates awaiting for last semester BE/B.Tech 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.
- Candidates with valid GATE score in the above-mentioned branches will be preferred and admitted on merit basis (as per GATE score).
- The remaining vacant seats will be filled up through the university entrance examination (ASTUEE-2024)
- Statutory Reservation and Relaxation Policy shall be followed as per the Government Rules.
- The list of selected candidates for counseling/admission will be notified in the university website: <https://www.astu.ac.in/>
- The selected candidates must have to produce the original testimonials and certificates (as mentioned in *Section 8 & 10*) at the time of counseling/admission.
- For any clarification, queries may be sent to: head.ee@astu.ac.in

5. SCHOLARSHIPS

Eligible GATE qualified candidates will receive GATE Scholarship under PG Scholarship Scheme of AICTE.

6. FEE STRUCTURE

The consolidated admission fees for M.Tech (Energy Engineering) are as follows:

Semester	First (1 st)	Second (2 nd)	Third (3 rd)	Forth (4 th)
Fee	Rs.27,300/-	Rs.18,100/-	Rs.18,100/-	Rs.18,100/-

7. IMPORTANT DATES

• Opening of the application submission process	22 May 2024
• Closing Date of application submission	10 June 2024 (11.59 PM)
• Declaration of Merit & Waiting list for GATE qualified applicants	12 June 2024
• Counseling/Admission of GATE qualified applicants	17 June 2024
• Issuance of admit card for the entrance examination starts	14 June 2024
• Date of Entrance Examination	22 June 2024
• Declaration of merit & waiting lists for the shortlisted/selected applicants from entrance exam	25 June 2024
• Counseling/Admission of entrance exam qualified applicants	29 June 2024

8. HOW TO APPLY

Interested candidates may submit application online by filling up & uploading the required documents [here](#)

8.1. Documents to be uploaded with the application form:

- A recent passport size colored photograph of the candidate should be uploaded in the online application form. Size of the photograph must be less than 256 kb, height and width of the photograph should be 200 pixel and 175 pixel, respectively. The photograph should be either in JPG/JPEG format.

- b) A scanned clear signature in JPG/JPEG format (size 256 kb) should be uploaded in the online application form . The height and width of the signature must be 75 pixel and 175 pixel, respectively.
- c) High School Leaving (10th standard) Certificate & Marksheet/Grade Card in a single PDF File (Max File Size: 1 MB)
- d) HS (10+2 standard) Certificate & Marksheet/Grade Card in a single PDF File (Max File Size: 1 MB)
- e) Certificate & Marksheet/Grade Card of BE/B.Tech in a single PDF File (Max File Size: 1 MB). *Candidates waiting for last semester BE/B.Tech results will have to submit (upload) 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.*
- f) Certificate & Marksheet/Grade Card of any other Degree/Diploma (if the candidate has received) in a single PDF File (Max File Size: 1 MB).
- g) Valid GATE score card in a single PDF File (Max File Size: 1 MB)
- h) The relevant certificate issued by the competent authority, if seeking admission under any reserved category as mentioned, in a single PDF File (Max File Size: 1 MB). *Caste/Tribe certificates MUST BE issued by the Competent Authorities recognized by the Government of Assam. Caste/Tribe Certificates of other state will not be valid.*
- i) Sponsorship/No Objection Certificate issued by the employer, if the candidate is employed.
- j) Online Application Fee payment Proof

8.2. Application fee:

The applicants shall have to pay a Non-refundable Application fee of Rs. 750/- (for General applicants) or Rs. 500/- (for SC/ST/OBC/MOBC applicants) in the following bank account through ONLINE mode of transaction:

A/C Name: Assam Science and Technology University

SBI A/C No: 33768271543

IFSC Code: SBIN0010670

MICR Code: 781002038

Branch: Assam Engineering College

Branch Code: 010670

N.B. The scan copy of the fee transaction proof to be uploaded with the application form (as mentioned above)

9. IMPORTANT INSTRUCTIONS TO CANDIDATES

- a) 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.
- b) The candidates must carry the original photo id proof which has been mentioned in the application, at the time of written test for verification.
- c) Applicants are required to submit the scanned copies of the supporting documents (as mentioned in *Section 8.1*) with the application form.
- d) 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.
- e) 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.
- f) No TA/DA and accommodation shall be provided for attending Written Test, counseling and interviews for admission in the course.
- g) Errors and omissions in notification and admission process are subject to corrections as per rules.
- h) Candidates are suggested to furnish the correct information in the application form. Applications with incorrect information will be summarily rejected.
- i) Canvassing in any form may disqualify the candidature of the applicant.
- j) The selected candidates must have to produce the original testimonials and certificates (as mentioned in *Section 8 & 10*) at the time of counseling/admission.
- k) For any clarification, queries may be sent to: head.ee@astu.ac.in

10. DOCUMENTS TO BE SUBMITTED/PRODUCED AT THE TIME OF COUNSELING/ADMISSION

If selected, the applicants must submit/produce the following documents (but not limited to) at the time of counseling/admission:

- a) Marksheets and Certificates of Academic Qualifications from HSLC (10th std) onwards
- b) Proof of Date of Birth (DOB), Proof of Last Semester Appearing & No running backlog in BE/B.Tech
- c) Valid GATE score card, Relevant certificate issued by the competent authority if seeking admission under any reserved category (as mentioned)
- d) Sponsorship/No Objection Certificate issued by the employer, if the candidate is employed
- e) Migration Certificate from the last attending institution
- f) Character certificate from the head of the last attending institution
- g) Anti Ragging Affidavit

PATTERN OF ENTRANCE EXAMINATION

- Date of Entrance Examination: June 22, 2024
- 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

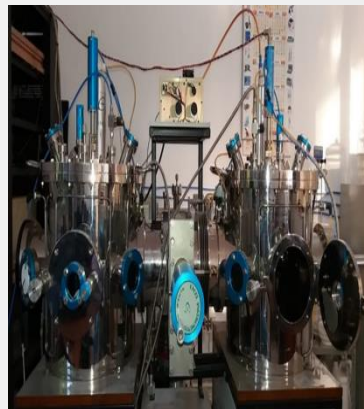
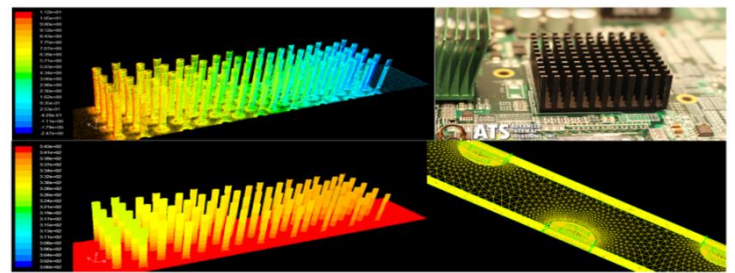
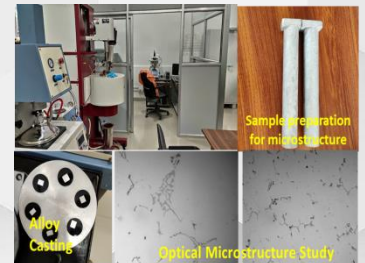
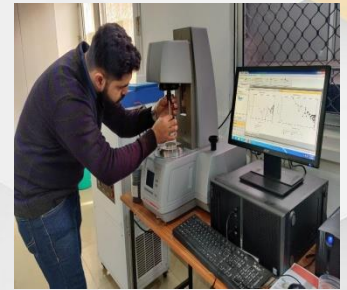
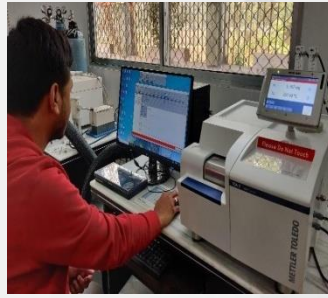
Heat Transfer Operations: Heat Transfer by Conduction, Convection (natural & forced convection), Radiation, Boiling, Condensation, Evaporation, Basics of Heat transfer equipment, Heat Exchangers

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.

Major Laboratory Facilities

- Thermogravimetric Analyzer (TGA)
- Differential Scanning Calorimetry (DSC)
- Pyrolysis Unit (lab scale)
- Bomb Calorimeter
- Rheometer
- Flush Point and Fire Point Apparatus
- Cloud Point and Pour Point Apparatus
- Flue gas analyzer
- Single Phase power Analyzer
- Hot air oven
- Muffle Furnace
- Soxhlet Extraction Unit
- Solar Cooker
- Muffle Furnace
- Soxhlet Extraction Unit
- Solar Cooker
- Biomass Cooking Stoves
- Hybrid PV Power Plant
- Plasma Pyrolysis Plant
- IC Engine System
- iPVD Reactor
- EGD Reactor



- Flat Plate Collector
- Evacuated Tube Collector
- Pyranometer
- Sunshine Duration Recorder
- Weather metering system
- Water/Soil analysis kit
- Electrical Shaker with Auger
- Flame photometer
- Centrifuge
- Atomic absorption spectrometer
- pH meter
- Four Ball Tester
- Journal Bearing Tester
- Pin/Ball on Disc tribometer
- Universal Testing Machine
- Micro Hardness Tester
- Furnace
- Optical Microscope
- Metallurgical Sample Preparation Units
- Computational Facilities (ANSYS)

Recent Publications in International Journals

- P. Bora, J. Kakoti, P. Saikia, N.J. Talukdar, M.M. Phukan, D. Rakshit; Exergetic and environmental life cycle assessments for waste cooking oil microemulsion biofuel in compression ignition engine. *Journal of Renewable and Sustainable Energy* (AIP), 2023; 15 (2): 023101. <https://doi.org/10.1063/5.0143658>. IF: 2.847
- M. Haque, P. Bora, M.M. Phukan and T. Borah, Bioenergy Generation and Value-addition from Processing Plant Generated Industrial Tea Waste: A Thermochemical Approach, *Biomass Conversion and Biorefinery* (Springer Nature), 2023. <https://doi.org/10.1007/s13399-023-04345-z>. IF: 4.050
- SR Sangma, MM Phukan, V Chongloi, DK Verma, P Bora, S Kumari, PP Pankaj, Phytochemical profiling, antioxidant and antimicrobial investigations on *Viburnum simonsii* Hook. f. & Thoms, an unexplored ethnomedicinal plant of Meghalaya, India. *Future Journal of Pharmaceutical Sciences* 9, 114 (2023). <https://doi.org/10.1186/s43094-023-00567-0>
- U. Bordoloi, D. Das, D. Kashyap, D. Patwa, P. Bora, H.H. Muigai, P. Kalita, Synthesis and comparative analysis of biochar based form-stable phase change materials for thermal management of buildings, *Journal of Energy Storage* (Elsevier) 55, 2022, 105801. <https://doi.org/10.1016/j.est.2022.105801>. IF: 8.907
- Flux enhancement of cellulose nitrate membrane through plasma assisted route for waste and mud water treatment (2023), Tonmoi Hazarika, Prince Das, Bharat Kakati, Dipankar Pal and Rimlee Saikia and Manoj Kumar Mahanta, *Polymers for Advanced Technologies*, 34(9), 2862-2878.
- Role of plasma process gas on permeate flux augmentation of cellulose nitrate membrane for mud water treatment (2024) Tonmoi Hazarika, Bharat Kakati, Dipankar Pal, Rimlee Saikia, Ankit Rawal, Manoj Kumar Mahanta and Subir Biswas, *Scientific Report*, 14:6585, 1-23.
- M. Baruah and K. Kalita, Effect of Longitudinal and Lateral Holes on the Performance of an Elliptical Pin Fin Heat Exchanger, *Transactions of Indian National Academy of Engineering* (Scopus index), 8, 2023
- I.H. Mondal, M. Baruah, N. Choudhury, Tribological Characterisation of Bio Lubricant from *Cucurbita pepo* L. seed oil, *Advances in Materials and Processing Technologies* (Scopus index), 2022
- M. Baruah and A. Borah, Impact Behaviour and fractography of 6061 alloy with Trace addition of Sn, *Frattura ed Integrita Strutturale*, 16, 2022
- Bhuyan, N., Bora, N., Boruah, K., Choudhury, N.D., Saikia, N., Katakati, R. (2024). Effect of Co and Ni impregnated ZSM-5 catalyst on pyrolysis products of *Tithoniadiversifolia*: Kinetic study and thermodynamics, *Process Safety and Environmental Protection*, 185, 807-816, <https://doi.org/10.1016/j.psep.2024.03.069>. (IF- 7.8)
- Bhuyan, N., Choudhury, N.D., Dutta, B.K. *et al.* (2023). Assessment of kinetic parameters, mechanisms and thermodynamics of *Tithoniadiversifolia* pyrolysis. *Biomass Conv. Bioref.* 13, 2703-2718 <https://doi.org/10.1007/s13399-021-01575-x>(IF- 4.0)
- Choudhury N.D and Saha, N. (2022). A preliminary investigation of Physicochemical, rheological and tribological properties of biolubricant from *Thevetia Peruviana* oil, *Tribology in Industry*, 44,641. (IF-1.4)
- Mondal, I.H., Baruah, M. and Choudhury N.D. (2022). Tribological characterization from *Cucurbita pepo* L. *Advances in Materials and Processing Technologies*,1-17. (I.F- 2.2)



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