

**TECHNICAL EDUCATION QUALITY IMPROVEMENT  
PROGRAMME (TEQIP) PHASE-III**

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**INSTITUTIONAL DEVELOPMENT PROPOSAL (IDP)**

**(April 2017 – March 2020)**



**For**

**Sub-Component 1.1**

**Institutional Development for Participating Institutions**

**Submitted by**

**ASSAM ENGINEERING COLLEGE**

**Guwahati-781013**

**ASSAM**

## 1. Institutional Basic Information

### 1.1 Institutional Identity

Name and address of the Institution	Assam Engineering College, Jalukbari, Guwhati-13
Year of establishment	1955
Is the Institution AICTE approved? Yes/No	Yes
Furnish AICTE approval No	1-538728541
Type of Institution Govt, funded/ Govt, aided/NIT	Govt. funded
Status of Institution	Non-Autonomous
Name and Designation of Head of the Institution	Dr. Atul Bora Principal, Assam Engineering College

### 1.2 Academic Information:

#### 1.2.1 Engineering UG PG and PhD programmes offered in Academic year 2016-17

S. No	Title of programmes	Level (UG, PG, PhD)	Duration (Years)	Year of starting	AICTE sanctioned annual intake	Total student strength in all years of study
1	B.E. in Mechanical Engineering	UG	4	1957	60	240
2	B.E. in Civil Engineering	UG	4	1955	90	360
	B.E. in Electrical Engineering	UG	4	1957	90	360
3	B.E. in Production and Industrial Engineering	UG	4	1998	20	80
4	B.E. in Electronics and Telecommunication Engineering	UG	4	1984	60	360
5	B.E. in Computer Science and Engineering	UG	4	1998	20	80
6	B.E. in Instrumentation Engineering	UG	4	1998	20	80

7	B.E. in Chemical Engineering	UG	4	1963	60	240
8	M.E. in Civil Engineering	PG	2		36	72
9	M.E. in Mechanical Engineering	PG	2		18	36
10	M.E. in Electrical Engineering	PG	2		18	36
11	PhD in Mechanical Engineering	PhD	3		10	30
13	PhD in Electrical Engineering	PhD	3		08	24
14	PhD in Civil Engineering	PhD	3		10	30

### 1.2.2 NBA Accreditation Status of UG and PG programmes as on 31st September 2017

Total no of programmes eligible for accreditation (at least one batch pass out)	10
No. of programmes accredited	NIL
No. of programmes applied for accreditation	NIL

### 1.2.3 Status of Faculty Associated with Teaching Engineering Students (Regular & Contract) as on 31st September 2017:

No.	Teaching Discipline/Department	Assistant Professor			Associate Professor			Professor		
		Sanct ioned Posts (Nos)	Filled-in (Nos)		Sanct ioned Posts	Filled-in (Nos)		Sanct ioned Posts	Filled-in (Nos)	
			Reg ular	Contr actual		Re gul ar	Contr actual		Reg ular	Contr actual
Engineering Disciplines/Departments										
1	CIVIL ENGINEERING	14	11	2	6	6	0	5	5	0
2	ELECTRICAL ENGINEERING	12	7	4	6	6	0	3	3	0
3	MECHANICAL ENGINEERING	18	9	0	6	6	0	3	3	0

4	COMPUTETR SCIENCE & ENGINEERING	3	3	0	2	1	0	1	0	0
5	ELECTRONICS & TELECOMMUNIC ATION ENGINEERING	4	4	0	1	1	0	1	0	0
6	CHEMICAL ENGINEERING	7	6	1	3	3	0	2	0	0
7	INDUSTRIAL & PRODUCTION ENGINEERING	3	0	2	1	1	0	1	1	0
8	INSTRUMENTATI ON ENGINEERING	3	1	2	2	2	0	1	1	0
	Total	64	41	11	27	26	0	17	13	0
Feeder Disciplines/Departments										
1	Mathematics	8	6	2	0	0	0	0	0	0
2	Physics	6	4	2	0	0	0	0	0	0
3	Chemistry	6	6	0	0	0	0	0	0	0
4	Humanities	4	4	0	0	0	0	0	0	0
	TOTAL	24	20	4	0	0	0	0	0	0
Total Regular					100					
Total Contract					15					
Total Sanctioned					132					
Total Vacancies					17					

## **2. INSTITUTIONAL DEVELOPMENT PROPOSAL (IDP)**

### **2.1 Introduction**

Assam Engineering College (AEC), the first engineering college in the north-east India, was established in the year 1955. The campus is spread across 400 acres of land. The college started with the Civil Engineering department, and within a few years other engineering departments were started. Presently, it awards Bachelor in Engineering degrees in eight different engineering disciplines, Master in Engineering degrees in Civil, Mechanical and Electrical Engineering, and Master in Computer Application degree. The college offers PhD programs under Civil, Mechanical and Electrical Engineering departments. All the courses of AEC are affiliated to Gauhati University and approved by AICTE.

The objectives of proposed IDP is

- i. To focus on improving quality and equity in engineering education by improving the learning outcomes and the research pursued under post-graduate programs through Technical Education Quality Improvement Programme (TEQIP) Phase-III.
- ii. To establish the necessary infrastructure to ensure better learning, research and innovative interventions in future.
- iii. To train the faculty and staff members.
- iv. To improve the employability of students through the career guidance cell and industry interactions.
- v. To enhance the functioning of the finishing school and improve the entrepreneurship cell activities

The successful completion of the project is expected to transform the academic delivery in the institution with significant improvements being made in the learning systems and active involvement of faculty in research and innovation.

### **2.2 Action Plan to fulfil the following objectives**

#### **2.2.1 Improving the learning outcomes of the students**

Efforts to improve the learning outcome need to be through effective design of assignments and other course works. Often the course works and assignments are delivered in a conventional mode across most of the branches of the study. The specific interventions proposed to improve the learning

outcomes of the students under this project are like setting up of language laboratories, Flip classroom, MOOCs, Swayam Prabha, etc. Some of the activities to be carried out under this project are: -

- Conducting induction programme for the first-year students
- Basic and Advance pedagogy training programmes shall be arranged in the institution
- Identifying student subject deficiency and inviting guest lectures
- Improvement in quality of life of society via various engineering courses
- Developing modern teaching and learning facilities in classrooms and laboratories
- By conducting remedial classes to support the weak students.
- By providing industrial visit for practical knowledge
- By providing industrial training/internship for practical knowledge
- The institute has 100 mbps speed lease line from NKN to provide internet facility. It has been extended through wired and wireless connection to faculty, staff and students of the college. Institute will target established a wi-fi campus.
- Enhancing learning facilities by subscribing e-journals like Elsevier, strengthening library by procuring books in different engineering fields and subscribing to digital library, procuring Academic softwares.
- Monitoring performance evaluation of students on a periodic basis
- Analysing the result of faculty evaluation for taking remedial actions to improve the teaching learning process.
- An exit assessment at the end of the course to know the total effectiveness of the course learning
- Motivating the faculty continuously to improve performance
- Procurement of furniture for modernization of existing laboratories, establishment of new laboratories, libraries, Computer Centres and classrooms.
- Classrooms would be modernized with Smart Boards and Computer linked LCD Projectors with screen, which would capture better attention of the students than mere oral lecturing.
- V-SAT, Video Conferencing and Audio-Conferencing facilities will also be considered for Guest lectures or class lectures depending upon need and feasibility.
- Classrooms will be maintained well-lit and ventilated.
- Student would be encouraged to register on online course through MOOCs and also encourage to take credit and non-credit courses through Swayam platform.

- Swayam Prabha digital learning platform will be installed in hostels and departments to enhance the learning and knowledge of faculty as well as students.
- Revision of curriculum. The institution has revised its curriculum from the academic session 2016-2017.

### **2.2.2 Graduates employability**

Reputed companies of states visit the campus every year to recruit the students. The major hurdle the institution faces during the campus placement programme is the lack of professional competence of the students and their poor communication skills. The poor communication skills have prevented large number of academically good students to get a good job offer.

To improve the graduate employability of students at Assam Engineering College various activities that are either already incorporated or that can be introduced, are summarized here as follows: -

- Establishing Start-up cell/club with participation of students
- Awareness drive/ workshops about the idea of 'Innovation' & 'Start-up'
- Providing seed money to students for their projects
- Conducting Expert Lectures promoting innovation and Motivating students through local entrepreneurs
- Organising as well as attending E-summits, conferences, seminars and other Entrepreneurship fests
- Exposure visits to start-ups, incubation centres, venture capitals, incubation/ research parks
- Establishing Training and Placement Cell with students and faculties
- Identifying requirements of students for making them industry ready through a team of faculty/external agency
- Training on leadership skills, entrepreneurship skills, managerial skills, communication skills, collaborative skills, etc. individually or collectively
- Organizing pre-placement programs for the students.
- Setting up Language Labs for communication skills.
- Organizing mock Interviews and Group Discussions.
- Arranging crash courses on technical topics of respective disciplines.
- Providing Gate coaching and encouraging to participate in gate exam by providing registration fees under TEQIP III

### **2.2.3 Industry Institute Interaction**

Industry Institute Interaction Cell (IIIC) will be started as per plan that will take initiatives for increased collaboration with industry and for giving more exposure to students through training by Industry experts. Seminars and workshops will be conducted for students by industry people. Students will be encouraged to do live projects in the industry. Collaborative research programmes and participation of industry people in academic decision-making and invited lectures will be included. Some of the activities are as follows: -

- To form Industry-Institute-Interaction Cell (IIIC) in the institution to promote links to benefit students and faculty and to promote collaborative interdisciplinary research for offering solutions to real life problems.
- Signing MoU/ Agreement with the industries
- Awareness workshops for students to inform them regarding the different career paths.
- Arranging industry conclave
- Categorize students to take up internships depending upon the interest of the students
- Expert lectures from industries
- Participating in curriculum design, curriculum implementation, student assessment, training of students, exposing students to new technologies, and providing experts for certain instructional sessions
- Industrial visit for the 2<sup>rd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year students

### **2.2.4 Reforms/ Governance**

For proper implementation and monitoring of the project, the institutional governance will be improved by forming various governing committees at different levels. The transparency of the governance process will be reflected at every stage of management.

It also emphasises to improve the academic standards of the graduate, post graduate and research programmes in engineering. For governance and reforms, the following activities will be undertaken:

- Workshop will be conducted for faculty on accreditation procedures & Norms
- Vision & Mission statements, short term goals, strategies etc will be developed



- Formulation of course outcomes, program outcomes & program education objective
- Different formats/ rubrics for student assessment with respect to program outcomes will be Design & implement
- Industry and Alumni meeting will be conducted & minutes and outcomes will be recorded
- To Develop feedback mechanism for collecting response of students, alumni, employers etc
- Prepare documentation for filling Self-Assessment Report (SAR)
- Appointment of faculty for filling up vacant positions to maintain desired student teacher ratio (1:15 UG & 1:12 PG) and also faculty cadre ratio (1:2:6)
- To apply and get accredited by NBA and improving the NBA accreditation status
- To apply for academic autonomy from UGC
- The BOG will meet at least quarterly or as often as required and the minutes of BOG meetings will be published on Institution's website as promptly as possible.
- Revision of curriculum at per level of IITs, NITs and industry oriented by the experts from IITs, NITs and industries.

### **2.2.5 Faculty and Staff development Programme**

Faculty training for enhancing expertise in subject domain was already started as a part of NEQIP programme and the same is to be continued with more thrust on attending programmes which will enhance capabilities of faculty in doing research and for improving consultancy activities. In addition, faculty will also be trained for acquiring specialization for handling courses in the UG and P.G programmes under TEQIP III. Faculty are encouraged to upgrade their qualifications through Quality Improvement Programme (QIP) that has already implemented in the institution.

To improve productivity of faculties, they will be encouraged to participate in seminars, conferences and workshops, both National and International organized by the institute and other organization, short term research visit to laboratories/ institutions. Faculties will be encouraged to establish collaboration with academic institute and R&D organization within and outside the country through MoUs. Some of the activities are summarised as follows: -

- The faculty members will be sent for short term training programmes and collaborative research programmes to premier institutions in India and abroad.
- The faculty members will also undertake pedagogical training.

- The Administrative Staff will be training in respective functional areas, particularly in the use of modern office equipment, software, office automation, maintenance of records, procedures, etc.
- The training would also also cover motivation for time and material efficiency, and friendliness towards faculty and students.
- The Technical Staff in laboratories and workshops would be trained in their functional areas including operation and routine maintenance of both the existing and new equipment. The technical staff also would be motivated and encouraged to participate in training and to use the newly acquired expertise for the benefit of students and the institution.
- To encourage faculties to join Doctoral programmes

### **2.2.6 Research and development**

Research activities will be taken up in emerging areas and infrastructure will be set up to support activities in research projects. Research assistantships will be offered to research scholars who play a vital role in sustaining research activities in an institution.

Research and consultancy activities have been enhanced with the support from NEQIP. Enhanced interaction with industry which is targeted in this project will help in improved research and consultancy activities. Some of the activities are as follows: -

- To promote increased participation of faculty in research, R&D projects and consultancy
- To offer “Seed grant” for research to faculty members and / or students to venture into innovative research and to strengthen research culture in institutions
- To enhance the research facilities by procurement of latest equipments and machineries.
- Setting up of new laboratories with modern equipments.
- Enhancing E- Learning facilities by subscribing digital libraries and E- journals
- Enhancing computational facilities by purchasing high end workstations and academic softwares.
- Giving assistantship to UG, PG and PhD students of the college

### **2.3 An action plan with timelines**

**For obtaining autonomous institution status from UGC**

The college is affiliated to Guwahati University. To obtain autonomy Assam Engineering College has already started to initiate the process of NBA accreditation. The process may take 2 to 3 years time for obtaining autonomous institution status

#### **For Improving the NBA accreditation status**

The college has started the process for NBA accreditation. All efforts are undertaken to accredit all departments. A dedicated team under the leadership of some senior professor has been formed. The process may take 3 to 4 years.

#### **2.4 Describe the following in brief**

##### **Is any enhanced assistance /mentoring that the institution is looking forward from its ATU?**

Yes, the institution is looking forward for assistance/mentoring from ATU in the following areas:

- Preparation of massive open online courses (MOOCs), facilitating access of institutions to MOOCs
- Greater access to digital resources and Centralized Research hubs opened to all faculty

##### **Does your BOG need strengthening, if yes then how?**

The BOG forming process has been initiated and needs strengthening. BOG will be strengthened by including the member as per AICTE norms.

##### **Is there an ERP/MIS system existing, if yes then any improvement, modification Suggested?**

No, as of now no ERP system is existing. However, the institute will be for going for Cloud based College Management System covering all relevant modules.

##### **Is there any mechanism i.e. special classes being conducted in the institution for improving the GATE score?**

As of now there is no standard mechanism. But institution is planning to provide GATE coaching for improving the GATE score by hiring coaching agency under TEQIP III.

## **2.5 Twinning Plan with a high performing institute with the objective of capacity building knowledge transfer and developing long term strategic partnerships**

For capacity building knowledge transfer, exchange of faculty and student, research & development collaboration and developing long term strategic partnerships, institutions has planned to sign MOU with high performing institute like IIT Guwahati, IIIT Guwahati, NIT Meghalaya, NIT Silchar, etc

## **2.6 Is there any difficulty in Recruitment and selection of high-quality faculty? If yes, what are the reason & action plan to solve the issue?**

Faculty recruitment is done by Assam Public Service Commission and is a very long and difficult process as many approvals are required to take from the state govt. For expediting faculty recruitment process and selection of high quality faculties, institute will request the state government to grant recruitment autonomy to its BOG.

## **2.7 Give an action plan for ensuring that the project activities would be sustained after the end of the Project.**

The execution of the IDP will result in student's development with enhanced academic and non-cognitive skills, higher employability and entrepreneurial skills. Faculty and staff training will enhance their skills which will create a sustainable environment. Recruitment of new faculty will reduce the gap of teachers – student ratio. Establishment of new laboratories and modernizing the existing ones will lead to a world class facility for future students which will also help in internal revenue generation and that will indirectly help in operating and maintenance cost even after completion of project. It is evident that the project components will push the institution towards newer heights and hence the project sustainability after the end of the project is ensured.

The institution also plans to create funds for the sustainability of the good work initiated under the project. State government as well as external agencies like oil industries located in the region will also be approached for funding the activities through collaboration.

## **2.8 Describe briefly the participation of departments/faculty/students in the IDP preparation.**

The IDP has been constituted after continuous meetings participated by the TEQIP coordinators from each department of the college. Based on the inputs of the concerned persons from each department, an Institutional Development Plan (IDP) and an action plan has been prepared for TEQIP-III project.

