

# Institutional Development Proposal under TEQIP-III

## INSTITUTIONAL BASIC INFORMATION:

### 1. Institutional Identity

- Name of the Institution : **DIBRUGARH UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY (DUIET)**
- AICTE permanent ID no : **1-492932031**
- Furnish copy of AICTE approval letter for 2017-18: **ENCLOSED**
- Type of Institution : 

Degree	
--------	--
- Category of Institution : 

		<b>University Deptt.</b>
--	--	--------------------------
- Status of Institution : 

<input type="checkbox"/>	Autonomous Institute as declared by University
<input type="checkbox"/>	Non autonomous and Affiliated to
<input checked="" type="checkbox"/>	Constituent college/Department of
<input type="checkbox"/>	Affiliated to Deptt of Technical Education
<input type="checkbox"/>	Government
<input type="checkbox"/>	Affiliated to Technical Board of State
<input type="checkbox"/>	Any other (specify)
- Name of Affiliating State Deptt / Board/University: **DIBRUGARH UNIVERSITY**
- Full time Head of the Institute available : 

Yes
-----
- Name & Designation of Head of the Institution : **DR. MUKUL CHANDRA BORA**

Nature of Full time appointment

Regular
---------

□

**1.2 Academic Information:**

- Diploma, UG and PG courses in Engineering offered in Academic year 2017-18: **UG & PG**
- Total number of courses being conducted by Institute: **05 ( 04 UG + 01 PG)** □

**Details of the courses :**

S. No	Level (Diploma, UG, PG, PhD)	Programmes	Course	Duration (Years)	Year of starting	No. of Batches passed out	AICTE sanctioned annual intake				Total student strength
							14-15	15-16	16-17	17-18	
	UG	B.TECH	Computer Science & Engg.	4 Years	2009	05	60	60	60	60	240
	UG	B.TECH	Electronics & Communication Engg.	4 Years	2009	05	60	60	60	60	240
	UG	B.TECH	Mechanical Engg.	4 Years	2009	05	60	60	60	60	240
	UG	B.TECH	Petroleum Engg.	4 Years	2009	05	60	60	60	60	240
	PG	M.TECH	Mechanical Engg.	2 Years	2013	01	00	00	00	18	18

• **NBA Accreditation Status of eligible Diploma courses:**

Course	Whether accredited as on date of submitting application	Reference Number and date of Accreditation letter (attach copy)	Accreditation valid up to (specify date)
-----NOT APPLICABLE-----			

• **NBA Accreditation Status of eligible UG courses:**

Course	Whether accredited as on date of submitting application	Reference Number and date of Accreditation letter (attach copy)	Accreditation valid upto (specify date)
-----YET TO APPLY-----			

**NBA Accreditation Status of eligible PG courses:**

Course	Whether accredited as on date of submitting application	Reference Number and date of Accreditation letter (attach copy)	Accreditation valid upto (specify date)
YET TO APPLY			

**Details of Diploma courses which will become eligible for Accreditation during 2017-18:**

- | Course                   | Date on which the course will become eligible for applying for NBA accreditation |
|--------------------------|--|
|                          |  |
| -----NOT APPLICABLE----- |  |
|                          |  |
|                          |  |

**• Details of UG courses which will become eligible for Accreditation during 2017-18:**

Course	Date on which the course will become eligible for applying for NBA accreditation
Computer Science & Engg.	01/08/2019
Electronics & Communication Engg.	01/08/2019
Mechanical Engg.	01/08/2019
Petroleum Engg.	01/08/2019
Mechanical Engg.	01/08/2019

**• Details of PG courses which will become eligible for Accreditation during 2017-18:**

Course	Date on which the course will become eligible for applying for NBA accreditation
Mechanical Engg	01/08/2019

**1.3 Status of Faculty Associated with Teaching Engineering Students (Regular & Contract) as on date of submitting the application:**

Faculty position	Number of faculty required as per AICTE norms	Present Status : Number in Position by Highest Qualification																	Total Number of regular faculty in Position	% of faculty positions filled on regular basis	Total shortfall against sanctioned post	Total Number of contract faculty Position	% of Total faculty positions filled	
		Doctoral Degree				Masters Degree				Bachelors Degree				Diploma										
		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and Humanities)		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and Humanities)		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and Humanities)		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and Humanities)								
		R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R						C
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 (4+6+8+10+12+14+16+18)	21	22 (3-20)	23 (5+7+9+11+13+15+17+19)	24	
Director	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	
Prof	4	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	0	4	0	0	
Asso Prof	8	8	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	12.5	7	0	12.5	
Asst Prof	41	36	--	2	0	32	0	0	5	0	2	0	0	0	0	0	0	0	34	94	2	7	78.84	
Lecturer	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Any other	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	54	49	1	--	2	--	32	--	--	5	--	2	--	--	--	--	--	--	36	--	13	7	--	

**Prof = Professor; Asso. Prof = Associate Professor; Asst Prof = Assistant Professor; R=Regular, C=Contract**

[Kindly provide separate one page faculty profile in the format given at **Appendix- I.**]

**1.4 Status of Board of Governors:**

- Whether Board of Governors is in place : Yes
- Whether an eminent educationist or industrialist is made the Chairperson of BOG : Yes

[Kindly attach a copy BOG notification]

## 2. DETAILED INSTITUTIONAL DEVELOPMENT PROPOSAL

### 2.1 Executive Summary of the IDP

Institute of Engineering and Technology, a constituent college of Dibrugarh University was started in the year 2009 with an aim to produce quality technical manpower required by the Industry. It is the only Engineering College covering the mineral and agricultural rich districts of Assam, viz. Dibrugarh, Tinsukia, North Lakhimpur and Dhemaji. This prestigious Institution could not functioning upto the mark of its aim and objective to become a centre of excellence due to inherent financial crisis which is a common problem to all the State Government run Institutions. The first batch of our students has already passed in the month of July 2013 and a small fraction of them was placed through campus placement. To increase the employability of the students of this Institute we want to build up the infrastructure which can impart knowledge and skills and can be able to mitigate its locational disadvantages. The locational disadvantages can only be mitigated through a well equipped Training and placement cell with the facility of Video conferencing with high speed internet connectivity. Although the Institute is well connected by Rail, Road and air but due to lower number of flights plying between Dibrugarh and other metropolitan cities the employer are reluctant to come to this Institute and rather they prefer the mode of Video Conferencing. Also the entire Training Cum Placement cell is to be equipped with world class infrastructure to make it a virtual interview place for which huge amount of fund is required which is almost impossible in its present state of Internal Revenue. Also the Department of Petroleum Engineering requires lot of imported equipments which are in the tune of Crores as the materials to be purchased in terms of foreign currency. The Department of Civil Engineering which is one of the mostly sought Departments by the students could not be started due to non completion of the Academic Building of the Department. The ground floor of this building is almost complete and we require about 1.5 crore to complete the other two floors. The process for which is already going on but the ultimately we have to face the financial crunch due to our own revenue. This project will boost our Institute financially with the support of which we will be able to achieve our goals in terms of building up of infrastructure for enhancement of teaching and learning facilities, increasing the employability of graduates, Research and Development and Internal revenue generation by the way of Sponsored Research and Industrial Consultancy. The Institute is presently offering B.Tech courses in Computer Science and Engineering, Electronics & Communication Engineering, Mechanical Engineering and Petroleum Engineering. An M.Tech course on Thermal, Fluid and Energy Engineering is started from this year under the Department of Mechanical Engineering. It is proposed that the Department of Civil Engineering will be started from the next academic session if permitted by AICTE. The admission to the institution is done CEE Assam and JEE of CBSE, New Delhi. The percentage of seat allocation is 75% and 25 % respectively. The presence of substantial number of SC/ST and OBC students is one of the parameters for the entire parts of upper Assam beyond the districts of Jorhat. The institute is going to make a Technology Incubation and Innovation centre under the Directorship of one NASA awardees from Assam. This proposal for assistance under AICTE-NEQIP Sub component 1.1 has been prepared, based on a SWOT analysis and Training Need Analysis conducted in the Institute. In linkage with the findings of SWOT analysis, the strategic plan was prepared with the general objective **‘To transform the Institute from its present state to an Institute of Excellence for International Recognition’**. In order to achieve the stated goal, Institute of Engineering and Technology, Dibrugarh University has set the following objectives:

- Improve Employability and Learning Outcomes of Students
- Effective Industry-Institute and Society-Institute Interactions
- Augment R&D and Consultancy Services
- Empower and Motivate Employees for Improved Performance

- Expand Teaching-Learning Facilities
- Implement Institutional Reforms

Specific objectives are determined under each general objective have been set as identified in SWOT analysis. Based on Training need analysis (TNA) and the development plan, a detailed training plan is under preparation and will be submitted soon after the submission of this draft proposal. The major training programmes planned can be broadly classified as follows:

- Trade skill training intended for lab staff
- Training mainly for teachers in subject areas and for support staff on the basis of job requirement
- Life skill training for all staff to improve soft skills
- Managerial Training for administrators and senior faculty members/heads of department
- The IDP also involves schemes for ensuring equity and also societal intervention and support.

Detailed action plan to achieve each of the objectives have been arrived at by the involvement of all staff of the institution. The estimated institutional budget is around Rs. 10 Crore as shown below.

## 2.2. Details of SWOT analysis

### Procedure adopted:

The SWOT analysis was conducted in this Institute taking the ideas of all the stakeholders of this Institute under the chairmanship of Dr. Mukul Chandra Bora, Director of the Institute. He has got 6 years of Industrial experience and 17 years of years teaching and research experience in Technical Education Department of Government of Assam. In this study, the brainstorming for the SWOT data generation is carried out in two levels. The data are collected during separate interactive formal brain storming sessions for different categories of stake holders. The groups were made aware of the SWOT analysis procedure and sessions were handled by the facilitator. In the second level, consolidation of factors is done with the help of 2 members from the employee category. In the final round, grouping of factors was done by the SWOT specialist in consultation with top management prior to going ahead with the analysis.

Major findings from the SWOT analysis are listed below.

### **STRENGTHS**

- ❖ Meritorious students selected through state level CEE and JEE of CBSE
- ❖ Efficient, enthusiastic, committed, congenial and qualified faculty and supporting staff appointed on regular basis by the University after the recommendations from the selection committee with the members drawn from IITG and other reputed Universities.
- ❖ Government supported schemes, funds, and scholarships for students are available.
- ❖ Efficient policy making management.
- ❖ Pristine environment with ample space for expansion
- ❖ Surrounded by big Industrial Houses like Oil India Limited, ONGC Ltd, Coal India Limited, Indian Oil and world famous tea Industries.
- ❖ Well Connected by Rail, Road and Air
- ❖ Adjacent to National Highway NH-37

- ❖ Ideal Institute for sponsored Research and Industrial Consultancies, Effective Industry-Institute Interaction
- ❖ Good Civil Infrastructure for the existing Department is in place.

### **WEAKNESSES**

- ❖ Shortage of faculties with doctorate degree and Research exposure
- ❖ Shortage of senior faculty members like Professor and Associate Professor.
- ❖ Non availability of Wi-Fi and secured Intranet throughout the campus
- ❖ Shortage of Computers and Computing facilities for Students
- ❖ Shortage of high performance computing facilities for research and other academic use
- ❖ No PG courses in CSE & EEE which causes less research opportunities in the department concerned.
- ❖ Shortage of Text and Reference books, Journals
- ❖ Poor status of the Training cum Placement cell, poor soft skills of students for placement.

### **OPPORTUNITIES**

- ❖ Being the only engineering college in the mineral and agricultural districts of Assam ample scope for consultancy and sponsored research project to increase Internal Revenue Generation
- ❖ Opportunity for societal upliftment for the weaker sections of the society in terms of Technology transfer, creation of entrepreneur in the rural areas for low cost building materials, green building materials.
- ❖ Skill development programs for the general public can be arranged
- ❖ More chances for establishment of Tea Industry based consultancy and research as almost 80% of the Tea industries in Assam is in the vicinity of the Institute.
- ❖ Possibility of MOUs with companies and institutions for Academic and Research.
- ❖ Proximity to centrally funded institutions like IITG, Tezpur University

### **THREATS**

- ❖ Shift in demand pattern from engineering sector to service sector
- ❖ Inability to cope up with advanced technology in Technical Education
- ❖ Upcoming new self financing colleges and universities with modern infrastructure and International collaboration
- ❖ Non availability of Senior faculties

The strategies identified on the basis of SWOT analysis are summarized below S O Strategies

- ❖ Promote entrepreneurship ventures and consultancy projects by meritorious students under the guidance of teachers
- ❖ Conduct Short term courses aimed at skill development on a regular basis

- ❖ Strengthen Industry Institute Interaction Cell
- ❖ Strengthening of the existing Entrepreneurship Development Cell
- ❖ Establish Community Development Centre
- ❖ Encourage faculty to participate in technical workshop and short term courses
- ❖ Hire research scholars/ Professors from IITG and Tezpur University and retired faculty on contract basis to plug the shortage of senior faculties with strong exposure towards Research and Development
- ❖ Increase interaction with premier institutions for capacity building of the existing faculties
- ❖ Development of soft skills in students through professional trainer
- ❖ Establish Wi-Fi and high-end computing facility which can be used for academic events and publications to improve visibility
- ❖ Undertake R&D in Tea, Oil, Coal and Gas to cater to the local needs
- ❖ Establishment of Earthquake Engineering Research Centre and Research centre of Hill Slope Stability problems as we are in the vicinity of the hill states of North East India
- ❖ Conduct remedial classes to weak students and consultancy purposes
- ❖ Strengthen libraries with text books, reference books, and Journals
- ❖ Establishment of E-library in the Institute

### **2.3 ‘Strategic Plan’ developed for institutional development**

Introduction of new PG programmes with Industry based course curriculum

- ❖ Equip labs with modern technical laboratory setup to catch-up with rapidly changing technologies
- ❖ Offer scholarships to attract talented students to gain competitive advantage
- ❖ Utilize services of retired teachers on contract basis or visiting faculty lecture scheme
- ❖ Add more UG courses
- ❖ Initiate action to get qualified people on contract basis who have better knowledge about latest technology
- ❖ Establish and increase research and PG in CSE and EEE with special emphasis on Biomedical Engineering
- ❖ Offer UG and PG programmes simultaneously in the area of Geotechnical Earthquake Engineering and Disaster Management
- ❖ Establishment of Continuing Education cell and offer industry oriented add-on courses
- ❖ Establishment of Student Counseling Cell
- ❖ Train faculty in pedagogy/ management and frontier areas of technology through STTP
- ❖ Improve system performance by achieving autonomy, office automation, and staff training



- ❖ Environmental protection and green campus activities
- ❖ Strengthening of the Training and Placement Cell
- ❖ Establishment of Quality Parameters through ISO Certification

General objectives of the Institutional Development Proposal and elaborated specific objectives and expected outcomes, in terms of Institutional development and increasing the employability and learning outcomes of graduates, linked with SWOT analysis.

### **VISION, MISSION AND VALUES**

The institute stands for the following:

**VISION:** Create a better platform driven by technology and rooted in values through enlightened and empowered future engineers.

**MISSION:** To impart quality technical education and develop high quality future technocrats with creativity, innovation, leadership, ethical values and societal commitment for the integrity and prosperity of the country.

**VALUES:** Activities of the institution will be Impartial, Transparent, Ethical, and ensuring Equity and Excellence.

## **2.4 Objectives and expected results in terms of, “Institutional Strengthening and improvements in employability and learning outcomes of graduates**

The general objectives of the proposal are aligned with the institutional vision and mission and values. The proposal pursues a strategic planning on the basis of the results of SWOT analysis for institutional development. The comprehensive objective of the institute which is in its 5<sup>th</sup> year since inception is “**To transform the Institute from its present state to an Institute of Excellence for International Recognition**”. As such, the general objectives are arrived at from various perspectives are:

1. Improve Employability and Learning Outcomes of Students
2. Effective Industry-Institute and Society-Institute Interactions
3. Implementation of Sponsored Research and Industrial Consultancy Services
4. Empower and Motivate Employees for Improved Performance
5. Expand Teaching-Learning Facilities
6. Implement Institutional Reforms

The Specific objectives under each general objective have been set based SWOT analysis. The details of general objectives, specific objectives, linkage with SWOT analysis are given below:

### **IMPROVE EMPLOYABILITY AND LEARNING OUTCOMES OF STUDENTS**

#### **GENERAL:**

- ❖ Promote entrepreneurship ventures and consultancy projects with active participation of students under the guidance of teachers

- ❖ Industry based PG programmes to suit Industrial needs
- ❖ Conduct Industrial consultancy/training to students in the final year
- ❖ Conduct remedial classes to weak students
- ❖ Develop positive attitude in students through counseling
- ❖ Establish an effective feedback system from the employers for alumni
- ❖ Equip laboratories with modern technical laboratory set-up to cope up with rapidly changing technologies
- ❖ Provide scholarships to attract talented students to gain competitive advantage
- ❖ Establish Wi-Fi and high-end computing facility which can be used for academic and consultancy purposes
- ❖ Establish and increase research and PG in CSE and EEE with special emphasis to Bio Medical Engineering
- ❖ Acquire ISO certification for the Institute

#### **EXPECTED RESULTS:**

The Institute would like to be an Institute which produces world class technocrats and most sought Institute for the employer. It is hoped that the number of Post-Graduates will increase by 200%, to attain 90% transition rate (SC/ST-70%), 80% through campus placement. 35% students should be able to qualify in GATE/CAT/GRE and other competitive examinations. It is expected that 50% of the PG students will be able to take up research and become future faculties of this Institute or elsewhere.

#### **EFFECTIVE INDUSTRY-INSTITUTE AND SOCIETAL-INSTITUTE INTERACTION**

- Enhancing the activities of Industry Institute Interaction Cell
- Strengthen the Entrepreneurship Development Centre
- Promote entrepreneurship ventures and consultancy projects by meritorious students under the guidance of teachers
- Implement combined projects by attaining MoU with industries
- Use high-end computing facility for consultancy purposes
- Improving the interaction through Visiting Faculty Programme by inviting experts from industry
- Providing In-plant industrial training for students
- Combined ventures such as Workshops, Seminars, and Conferences by institute and industry

#### **EXPECTED RESULTS:**

Training to supplement teaching and learning at the institution to produce ready to employ graduates. At least 30% projects will be done in collaboration with Industry, 30% of projects with direct social impact especially for weaker sections of society for their economic upliftment. Nurturing Entrepreneurs from campus to make startup ventures from the institute by the end of project period.

#### **AUGMENT R&D AND CONSULTANCY SERVICES**

- ❖ Equip labs with modern laboratory set-up to catch-up with rapidly changing technologies
- ❖ Establish and increase research and PG in CSE and EEE to improve research activities
- ❖ Experimental test set-up and testing facility can be established for consultancy from private/Govt. organizations

- ❖ Encouraging publications in conferences and journals
- ❖ Support to participate in international events such as conferences, workshops, and seminars
- ❖ Meritorious students with scholarships can participate in consultancy projects under the guidance of teachers and help to establish new entrepreneurship ventures
- ❖ Training on advanced technology areas for faculty/staff
- ❖ Undertake R&D in Tea Industry to cater to the local needs

#### **EXPECTED RESULTS:**

100% Increase in Consultancy projects and consultancy revenue. R&D, Publications and patents to reach top echelons in limited time. To involve 75% of faculty in R&D activities. To have minimum 4 MOUs with industry for collaborative activities, Improved Industry-Institute interactions and achieve minimum 6 industry interactions/year.

#### **EMPOWER AND MOTIVATE EMPLOYEES FOR IMPROVED PERFORMANCE**

- ❖ Conduct short term courses by eminent Professors from NIT or IIMK aimed at knowledge and skill development for faculty
- ❖ Pedagogical training to all faculty members
- ❖ Training on service and purchase rules, and establishment procedure for administrative staff
- ❖ Training on industry systems with in-plant exposure, to faculty and technical supporting staff
- ❖ Training on Innovative content development to faculty
- ❖ Managerial Development Programs for officials and senior faculty
- ❖ Practical training to keep pace with advancements in information and communication technology

## **EXPECTED RESULTS:**

Achieve overall development of the employees by imparting life skills along with the required technical training from time to time. Impart necessary training to 100% of faculty and staff during the project period. All senior faculties trained in institutional management. 75% of faculty sponsored for conferences/workshops/seminars/academic interactions in premier institutions in India and abroad.

## **EXPAND TEACHING AND LEARNING FACILITIES**

- ❖ Equip labs with more modern technical set-up to catch-up with rapidly changing technologies
- ❖ Utilize services of retired teachers on contract basis or visiting faculty lecture scheme
- ❖ Hiring research scholars/Professors from IITG and Tezpur University on visiting basis that can plug the gap
- ❖ Obtaining subscriptions for more on-line refereed journals
- ❖ Procuring recently published books and periodicals
- ❖ Enhancing facilities of digital library
- ❖ Develop positive attitude in students through proper training
- ❖ Establish Wi-Fi and high-end computing facility which can be used for academic and consultancy purposes
- ❖ Initiate action to get qualified people on contract basis who have better knowledge about latest technology
- ❖ Offer more PG programmes so that scholars can handle classes to plug the gap
- ❖ Start more UG programmes in Civil Engineering and thrust areas like Biomedical Engineering
- ❖ Procuring additional furniture for offering comfortable learning environment
- ❖ Enhancement of audio-visual facility for smart class rooms

## **EXPECTED RESULTS:**

Will become self-reliant through improved pedagogical methods, gaining access to knowledge resources like E-library, E-journals and Webinars and by utilizing the services of experienced faculty from premier institutions. Full Wi-Fi campus. 100% smart class rooms, Live & Deferred streaming of expert lectures and Educational Resource Centre.

## **IMPLEMENT INSTITUTIONAL REFORMS**

- ❖ Achieving autonomous status for the institute for better flexibility especially in academic reforms
- ❖ ISO Certification of the institution
- ❖ NBA accreditation of all the degree programs
- ❖ Automation of institute administration
- ❖ Creation of facility for IT enabled course management which can be utilised by host as well as neighbouring institutions
- ❖ Environmental protection and green campus through activities of Nature clubs

## **EXPECTED RESULTS:**

Achieve an international reputation for the institution within 5 years. Attract meritorious students and staff to the institute. Offer technical education with the state of the art facilities in a green campus. Network with sister institutions for a synergistic development. Improved system to contribute substantially for the Nation building.

Action Plan to achieve the results and to implement the proposal

The action plan is prepared keeping the general and specific objectives in view and in strict adherence to the AICTE-NEQIP project.

Improving employability of graduates

It is proposed to tackle the employability issue of students by short-term and long-term measures. During the project period all the short-term measures will be implemented and long-term measures initiated. The short-term measures include the following;

### **I. Conduct remedial classes to weak students**

The present transition rates of students are in the range of %. The result analysis of the students have been already carried out and the subjects in which the failures rates are high have been identified. It is proposed to conduct remedial classes to the weak students in such subjects during evening hours and holidays. The services of faculty, guest faculty, PG students and experts from outside the institution will be utilised for the purpose. It is expected to increase the overall transition rate above 90 % (70% in case of SC/ST) by the end of the project period

### **II. Develop positive attitude in students through counseling**

Ninety percent of the students in the institution are hailing from other districts of the State. Most of them are at present staying in private hostels without proper care and this has led to some negative attitude in few students (one of the weaknesses identified during the SWOT analysis). The institution at present is utilizing the services of a professional counselor. It is proposed to establish a full fledged Counseling Cell in the institution and enhance the counseling activities and develop positive attitudes in students. It is also proposed to conduct regular training programmes by professionals.

### **III. Establish Finishing School for Communication and Soft skill development**

From the feedback obtained from the recruiters, it is identified that lack of proper communication skills and soft skills are the major weaknesses of the students who hail from rural background and from economically weaker sections. It is proposed to establish a Finishing School to improve the soft skills of the students. The Language lab will be strengthened. Diagnostic test will be conducted and the students screened. It is planned to conduct intensive training programmes in communication skills on a regular basis. Soft skill development programmes also will be conducted on a regular basis.

### **IV. Strengthen the facilities of the Training & Placement Cell**

It is proposed to strengthen the Career Guidance and Placement Cell of the institution with state of the art facilities. Group discussion facility, conference room facility, Interview rooms and a state of the art digital seminar hall with facilities for audio and video conferencing will be established for the purpose. Steps will be taken to improve the presentation skills and personal interview skills of students. Training on group discussions, and interviews and analytic capabilities and other interview skills will be conducted on a regular basis. Mock interviews and mock group discussions will be arranged with the assistance from industry. Professionals, especially those from the Human Resources wing of reputed industries shall be invited to conduct sessions on improving the communication skills of students. Regular examinations and review will be conducted to assess the success of such programmes.

## V. Provide scholarships to attract talented students

It is proposed to offer more scholarships to students from economically weaker sections which in turn will attract meritorious students to prefer the institution. At present scholarships are given to GATE qualified students who undertake PG courses. It is proposed to provide scholarships to all non-GATE students. This will attract more students to come forward for PG programmes.

## VI. Improve credibility and visibility of the institution

The visibility and credibility of an institution will help attract meritorious students to prefer the institution. It is proposed to get NBA accreditation to all eligible courses and ISO certification for the institution within two years for better credibility. It is also proposed to host National Conferences, Workshops and Seminars in thrust areas to increase the visibility of the institution at the National and International level. Experts from National institutions will be invited to interact with the students and faculty. This will also provide an opportunity to showcase the activities of the institution before experts.

## VII. Establish Educational Resource Centre

It is proposed to establish an Educational Resource Centre for content generation, consolidation and management. A digital media studio for content generation will be used for content generation in video and text format on various engineering topics. The content will be shared with other institutions.

## VIII. Conduct coaching classes for GATE/CAT/IES and other competitive Examinations

Institute of Engineering and Technology, Dibrugarh University is going to set up one coaching centre for the GATE aspirants as almost all the public sector enterprises recruited through GATE score. Under this scheme SC/ST students are given special coaching in evening hours and on holidays. During the project period it is proposed to extend the coaching classes to other competitive examinations and also to include all categories on students.

Special preference will be given to girl students who constitute more than 50% of the student population. The students will be encouraged to write such competitive exams, Previous questions will be discussed, solved questions will be distributed and practice test conducted on a regular basis.

The long term measures include the following;

### I. Designing of industry-oriented curriculum

On obtaining full academic autonomy, steps will be taken to design and implement a curriculum which will address the changing needs of the industry. The experts from industry will be included in academic committees. Industrial visits will be made mandatory and students will be encouraged to undertake industry related projects.

### II. Ensuring fruitful industry-institute interaction

Immediate focus shall be on improving the relationship with the industry by strengthening the Industry Institute Interaction Cell. Steps will be taken to ensure that all students are aware of the needs and expectations of industries. Experts from industry will be invited to address the students on a regular basis. Steps shall be taken to set up Incubation Centre in the campus.

### III. Utilising the network of alumni to bring in more companies for Recruitment

The Career Guidance and Placement Cell shall work closely with the Alumni Association of the college to get in touch with the alumni of the institution working in industry. The services of alumni will be utilised for giving employment orientation to students and also for bringing more companies for recruitment.

#### IV. Effective Feedback system from Employers

An effective feedback system from Employers on the performance of the graduates of the institution will be introduced. The feedback will be used for modifying the curriculum, training programmes and for introducing bridge courses.

## **COMPUTER SCIENCE & ENGINEERING DEPARTMENT**

### **Expected Outcomes:**

1. Department is getting strengthened by:
  - a. 100 percent eligible UG accredited within 4 years.
  - b. 100 percent trained institutional officials and senior faculty for increasing internal and external efficiency of the institution.
  - c. At least 10 MoUs with Reputed Institutions and Industries.
  - d. 100 percent overall students, faculty and parent satisfaction by conducting survey.
  
2. Human Resources-Faculty and Staff:
  - a) 100 percent Faculty members with M.Tech and as many PhD Qualifications as possible drawn from industries, R&D organizations and academics.
  - b) 10 percent of external revenue from Training, Research and Consultancy projects.
  - c) At least 02 publications in refereed national and international journals by each faculty in every year.
  
3. Human Resources – Students:
  - a. Increase percentage placement rate for UG students from 55% to 80%.
  - b. Attract high payment companies by consistent efforts.
  - c. Improvement in the academic performance of SC, ST, BC and other academically weak students from 55 percent to 90 percent.
  - d. Increase in transit rate from 1<sup>st</sup> to 2<sup>nd</sup> year for all the students from 60 percent to 90 percent.
  
4. Departments:
  - a. Get existing UG laboratories modernized and strengthened.
  - b. Get advanced equipment for training, research and consultancy as per latest industry requirements.
  - c. Continuously upgrade learning and research facilities with project funds.



**1.0 Faculty and Staff Development (including faculty qualification upgradation, pedagogical training, and organizing/participation of faculty in workshops, seminars and conferences) for improved competence.**

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>10 lakhs</b>	<b>40 lakhs</b>	<b>25 lakhs</b>

**Improving the learning outcomes of the students:**

**1.1 Faculty training (qualification upgradation, subject upgradation & research competence, Pedagogical training, participation in conferences, seminars/workshops etc.)**

Department of Computer Science and Engineering has very young and dynamic faculty members is strength of the department. The department has 06 nos. faculty possessing M.Tech degree who will be sponsored from TEQIP funds:

- For qualification upgradation to Ph. D degree in concerned field.
- Improvement in Teaching, Learning & Research Competences.

The faculty members of the department shall be encouraged to attend conferences, seminars/workshops etc. so that subject knowledge of the faculty members can be enhanced. The following activities shall be carried out:

- Training in pedagogy and management capacity development.
- Training in content up-gradation (both in-house and outside).
- Faculty deputation for Ph.D. programme and higher studies.
- Encouraging and sponsoring faculty for workshops and conferences
- Providing training to technical, support and administrative staff in selected areas (both in-house and outside)

**1.1.1 Basic and advanced pedagogy training**

Basic and Advance pedagogy training programmes shall be arranged in the department so that knowledge domain of the faculty members can be enhanced.

The following steps will be taken:

- Basic and advanced pedagogy trainings shall be organized in the department.
- Subject / domain knowledge enhancement programmes.
- Attendance in activities such as workshops, seminars, etc by the faculty members.
- Improvement in faculty qualifications for sponsoring faculty members for qualification up gradation.
- Improving research capabilities

### **1.1.2 Subject / domain knowledge enhancement**

To enhance subject knowledge of faculty members and students, the following activities will be undertaken during this project:

- Conducting 04 workshops/conferences/STC by the Department during TEQIP-III project.
- Conducting training programmes for improving efficiency, governance, productivity and responsiveness.
- Conducting continuous training programmes for basic and advanced pedagogy and domain knowledge enhancement.
- Enhancing number of participation in conferences, workshops and seminars
- Arranging qualification improvement programmes for faculty.
- Organizing programmes for exposing professional ethics.
- Registering Online courses offered by MIT, Stanford etc.

### **1.1.3 Attendance in activities such as workshops, seminars, etc.**

To enhance attendance of faculty members in workshop, seminars, conference etc. the following activities will be undertaken:

- Faculty members shall be sponsored to attend workshop/seminar/conference/FDPs in other institutions.
- Subject related workshop/seminar/conference/FDPs by the department shall be organized with in institution.
- To enhance attendance, faculty members shall be paid TA/DA/Boarding & Lodging as per TEQIP-III rules for attending workshop/seminar/conference/FDPs in other institutions.
- 

### **1.1.4 Improvement in faculty qualifications.**

The department has 06 nos. Faculty members having M.Tech degree will be sponsored for qualification up gradation under TEQIP project.

- To enhance improvement in faculty qualification, following activities shall be undertaken. Faculty members possessing M.Tech degree shall be sponsored to IITs, NITs and other premier institutions of the country for qualification upgradation.
- If faculty is enrolled for qualification upgradation either through full time or part time or by sandwich joint arrangement other than the parent Institution, they will be allowed to pay Fees charged for course work, registration fee etc., Use of research facilities Consumables, Expenses towards thesis printing and publication of thesis based research papers.
- If faculty is registered for qualification upgradation on fulltime or part time basis within the parent Institution : Consumables, Expenses towards thesis printing and publication of thesis based research papers.

### 1.1.5 Staff training (Technical & Administrative staff)

Technical and Administrative staff shall be deputed to undergo training to enhance capability in their domain work in reputed institutes offering such training programmes. The following areas are broadly identified in which the trainings are proposed:

- Medium and short term training courses are proposed in their domain areas (like web technology, Linux administration, networking, data base management, common software packages like MATLAB, MULTISIM and repair & maintenance of lab equipment etc ).
- Further the technical and support staff are to be trained for supervisory and skill development in using state of the art equipment and technology.
- Medium and short term training programs for newly appointed technical staff to carry out routine laboratory tests as per international standards.
- Medium and short term training courses are proposed in office automation.
- Communication skills Training Programmes for instructors shall be organized within the Institution.
- Carry out on-the-job training for both technical and non-technical staff within and outside the institute.
- Further, the institute intends to impart training and send the staff for outside training during summer and winter vacation so that the academics activities may not be affected.
- In addition to training in the field of one's specialization/trade, the department intends to give basic exposure of computer operation to all staff (technical and non-technical) of the institute.

### 2. Infrastructure improvements for teaching, training and learning through:

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>30 lakhs</b>	<b>60 lakhs</b>	<b>11 lakhs</b>

#### 2.1 New Laboratory for Image Processing and Data Mining

Sl. No	Name & brief Description of equipment	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost(in lacs)	Justification
1	Processor i7 Desktop Computer	5	0.70	3.5	Student can do practical works as well as project works on Image Processing and Data Mining
2	Desktop (Core i7-7500U/16GB DDR3L Ram/2TB/Windows 10 /4GB Graphics)	5	0.90	4.5	High processing system for mobile image processing application.
<b>Total</b>				<b>8</b>	

## 2.2 New Laboratory for Cognitive vision, Rehab Robotics and Smart Systems

SI No	Item	Quantity	Approx cost (per item excluding taxes) (in lacs)	Approx total cost(in lacs)	Justification
1.	Shadow Dexterous Hand + 5 BioTac Sensors	1 (Right only)	75000 USD (Rs. 48 approx)	48	Research on bio-mimetics and advanced prosthetics
2.	Turtle Bot 2 (with 3D sensor + NUC i5 controller + Europa CEE 7/16 power cods + 4400 mAh additional battery + docking station + 500 GB HDD extra NUC disc + WidowX robot arm + Assembly & configuration)	1	3500 USD (Rs. 2.25 approx.)	2.25	Learning & Research platform for Robot Localization and mapping ,compatible with ROS
3.	RP LIDAR A2 Thin LIDAR (16m)	2	600 USD (Rs. 0.39 approx.)	0.78	Advanced 360° Laser Scanner (for cognitive vision)
4.	Microsoft Kinect Sensor (with PC adapter)	1	Rs. 0.15	0.15	3D Depth scanner(for cognitive vision)
5.	STEREOLABS ZED Sensor (With PC Adapter)	1	500 USD (Rs. 0.32 approx.)	0.32	3D Depth Scanner, 6 axis positional tracking(for cognitive vision)
6.	Notebook (Core i7-7500U/16GB DDR3L Ram/2TB/Windows 10 /4GB Graphics)	2	Rs. 0.60	1.20	High processing mobile unit for robot mapping and localization
7.	FlashForge Dreamer (3D printer) + PLA Filament	1	Rs. 1.04	1.04	Rapid prototyping for new parts, devices and equipments
8.	Arduino Uno with sensors and components development kit	5	Rs. 0.05	0.25	For IoT applications
9.	Ultra development kit for Raspberry Pi 3 (with components and sensors)	5	Rs.0.04	0.20	For IoT applications
10.	DC Geared Motor with Encoder 185RPM 8N.cm 12V SPG30E-20K	6	Rs. 0.017	0.102	For IoT applications
11.	DJI Phantom 3 Standard Quadcopter	1	500 USD (Rs. 0.32 approx.)	0.32	For IoT applications
12.	Biogripp Robotic Hand(3D print)	1	1700 USD (Rs. 1.10approx.)	1.10	Rehab Robotics applications
13.	LiPo Batteries &	6( two	Rs.0. 25	1.50	For IoT applications

	balance chargers	each for 2200 mAh, 1000 mAh, 900 mAh)			
14.	LCD Projector + screen(wall mount, min 3500 lumen)	1	Rs.0.65	0.65	
15.	<b>Total</b>			<b>57.862</b>	

### 2.3 Up gradation of CSE laboratory I

Sl. No	Name & brief Description of equipment	Quantity	Approx cost (per item excluding taxes) (in lacs)	Approx Total Cost(Lacs)	Justification
1	Oracle Database 12C Standard Edition	15licenses	--	4.00	To cover the syllabus as per new syllabi
	<b>Total</b>			<b>4.00</b>	

### 2.4 Up gradation of CSE laboratory II

Sl. No	Name & brief Description of equipment	Quantity	Approx cost (per item excluding taxes) (in lacs)	Approx Total Cost(Lacs)	Justification
1	Processor i7 Desktop Computer	5	0.70	3.50	increase the present strength of the laboratory
	<b>Total</b>			<b>3.50</b>	

### 2.5 Up gradation of CSE laboratory III

Sl. No	Name & brief Description of equipment	Quantity	Approx cost (per item excluding taxes) (in lacs)	Approx Total Cost(Lacs)	Justification
1	Processor i7 Desktop Computer	5	0.70	3.50	increase the present strength of the laboratory
	<b>Total</b>			<b>3.50</b>	

### 2.6 Up gradation of CSE laboratory IV

Sl. No	Name & brief Description of equipment	Quantity	Approx cost (per item excluding taxes) (in lacs)	Approx Total Cost(Lacs)	Justification
1	DSP-2000 LAN Cable	1	1.80	1.80	To demonstrate the

	Analyzer and LAN cable meters				purpose of lan cables
2	Net-Sim	30	0.12	3.50	To demonstrate purpose of simulators.
3	48P 4 layer switch & 48 P 3layer switch	1 each	1	2.00	To cover syllabus as per new syllabi
4	24-port Gigabit Security Router VPN	2	1	2.00	To cover syllabus as per new syllabi
5	Network maintenance toolkit	1	0.35	0.35	To demonstrate accessories
6	Printer trainer	2	0.5	1.00	To demonstrate working mechanism and repair
7	All in one heavy-duty photo copier	1	1	1.00	To demonstrate working mechanism and repair
	<b>Total</b>			<b>11.65</b>	

## 2.7 Starting new PG and PhD programmes.

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	--	--	<b>20 lakhs</b>

AICTE has made mandatorily to have at least 01-NBA accreditation programme to start another 01- engineering programme in the institution. After obtaining NBA accreditation, department has planned to add following programmes:

- M. Tech in Computer Science and Engineering with intake of 18+ 5\* (\*sponsored seats) from the academic session 2018-2019.

## 2.8 Upgradation of eLearning Resource (Books & Journals)

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>5 lakhs</b>	<b>20 lakhs</b>	<b>5 lakhs</b>

### 2.8.1 Investing in smart classrooms, campus Wi-Fi (24\*7 broadband connectivity and Wi-Fi access in all academic buildings (with a minimum of 2 MBPS speed for each connection))

Department has 01- smart class room with the seating capacity of 60 persons. Online classes, NPTL lectures, ICT based short term courses are being organized in this smart class room. Institution is planning to develop 03 more smart class rooms under TEQIP-III project as per detail below, One smart class room in each semester classes with seating capacity of 60 students.

- All modern facilities like laptops, wireless projectors, LCD screen for video conferencing, Wi-Fi connections will be established in these smart class rooms.
- At present, the department has **100 mbps** speed lease line from NKN to provide internet facility through broadband connection to faculty, staff and students of the department. In addition to this, department is planning to take **50 mbps** additional Internet Back up from other service providers.

- Planning and Installation of IP based cameras or non IP Based Cameras in Computer laboratories. Smart class and campus for security and surveillance purpose.
- Air Conditioning system for server room and networking devices.
- UPS with batteries for electricity backup for computers in Computer laboratories and other planned smart class rooms.
- Software License Renewal, Laptops, Printers for faculty members and Portable Hard Disks.

### 2.9 Furniture for laboratory

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	9 lakhs	24 lakhs --	

### 2.10 Minor Civil Works

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	17 lakhs	11 lakhs	10 lakhs

### 2.11 GATE preparation

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	10 lakhs	22 lakhs	10 lakhs

Sl. No	Description of particulars	Quantity	Approx Total Cost per year (Lacs)	Approx Total Cost (in lacs)	Justification
1	Guest Faculty members (From IITs and NITs)	6	2	12	Remedial classes and doubt clearing session
2	GATE coaching	-	10	30	Preparation for exit examination
	<b>Total</b>			<b>42</b>	

### 3. Improving employability of the students

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	2 lakhs	5 lakhs	5 lakhs

#### 3.1 Enhancement of interaction with industry

To Promote Industry-department interaction the following action will be taken:

- Establishment of Industry-department Partnership /interaction Cell.
- Organizing Workshops, conferences and symposia with joint participation of the faculty and the industries.
- Encouraging engineers from industry to visit department to deliver lectures.
- Participation of experts from industry in curriculum development.
- Arranging visits of staff members to various industry
- Professional consultancy by the faculty to industries.

- Industrial testing by faculty & technicians at site or in laboratory.
- Joint research programmes and field studies by faculty and people from industries.
- Visits of faculty to industry for study and discussions or delivering lectures on subjects of mutual interest.
- Visits of industry executives and practicing engineers to the Institute for seeing research work and laboratories, discussions and delivering lectures on industrial practices, trends and experiences.
- Memoranda of Understanding between the department and industries to bring the two sides emotionally and strategically closer.
- Human resource development programmes by the faculty for practising engineers. Collaborative degree programmes. Short-term assignment to faculty members in industries. Visiting faculty/professors from industries. Professorial Chairs sponsored by industries at the Institute. R&D Laboratories sponsored by industries at the Institute. Scholarships/fellowships instituted by industries at the Institute for students. Practical training of students in industries.

### **3.2 Student career counseling and placement:**

The career counselling provides consultation for academic, personal, social and vocational development, to assist students in analyzing interests, aptitudes, personal traits, values, attitudes and desired lifestyles for suitable employment and educational opportunities. The office provides support for faculty, staff, and administration on the employment trends, standards, and requirements, affecting the particular office or department. Institution has designated faculty members to counsel students of each class on regular basis. These faculty members help students in academic planning for college and career readiness, enrichment and extracurricular engagement among the students.

- Expenditure towards inviting industry (excluding travel cost and lodging boarding) for campus interviews and hospitality during campus interviews.
- Tutoring by industry experts to prepare students for on- and off-campus job interviews.

### **3.3 Improving transition rates of all categories of students and improving non-cognitive skills of students**

- Honorarium, TA and DA to outside experts for specialized training in Finishing School Consultancy services procured for technical assistance related to knowledge/skill enhancement for weak students and establishing a Finishing School.

## **4. Startups and setup of Innovation & Incubation Centre**

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>10 lakhs</b>	<b>50 lakhs</b>	<b>30 lakhs</b>

### **The fund under this heading can be utilized for payment towards:**

- Publication of research papers in refereed journals available on Web of Science for faculty/ students.
- Commercialization of research products Patenting of research products



- Travel cost, hospitality and honorarium paid to experts for participation in Research & Development activities and for delivering expert lectures in the project department
- Organizing conferences on R&D topics/themes
- Developing research interest among UG students:
- Fiscal incentive (as per norms approved by the BOM) to students that voluntarily associate with Industry oriented R&D projects.
- Expenses on travel, boarding and lodging of students that associate with an Industry for about 3-4 weeks during vacations to continue work on R&D projects Consumables.
- Financial aid to the extent of 20% of total budget in Tech Fest/ project competitions.
- Seed grant for research to faculty members and / or students to venture into innovative research and to strengthen research culture
- Appointment of retired teachers from IITs/NITs/other reputed institutions as Senior Research Advisor for enhancement of Research & Development activities.

-----XXXX-----

## **ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT**

### **Expected Outcomes:**

#### **1. Department is getting strengthened by:**

- a) 100 percent eligible UG accredited within 4 years.
- b) 100 percent trained institutional officials and senior faculty for increasing internal and external efficiency of the institution.
- c) At least 10 MoUs with Reputed Institutions and Industries.
- d) 100 percent overall students, faculty and parent satisfaction by conducting survey.

#### **2. Human Resources-Faculty and Staff:**

- a) 100 percent Faculty members with PhD Qualifications.
- b) 10 percent of external revenue from Training, Research and Consultancy projects.
- c) At least 02 publications in refereed national/international journals by each faculty in every year and 01 publication in national /International conference every year.

#### **3. Human Resources – Students:**

- a) Increase percentage placement (In-Campus) rate for UG students up to 100%.
- b) Attract high payment companies by consistent efforts.
- c) Improvement in the academic performance of SC, ST, BC and other academically weak students from 55 percent to 90 percent.

#### **4. Departments:**

- a) Get existing UG laboratories modernized and strengthened.
- b) Get advanced equipment's for training, research and consultancy as per latest industry requirements.
- c) Continuously upgrade learning and research facilities with project funds.

### A. Departmental Infrastructure:-

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	Modernization and up gradation of class room with videoconferencing facility.	3	8.5	25.5	
2	Furnitures for Seminar/Conference room.	1	10	10	
3	Furnitures for Departmental Examination Cell.	1	2	2	
4	Classroom accessories (tutorial /elective classroom)	1	2	2	

### B. Departmental Common Up gradation :-

Sl No	Name & brief Description of equipment/items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	Installation of uninterrupted power supply (50-60KVA) for the Department.	1	25	25	
2	Installation of air-conditioner for Computer Lab., Embedded Systems Lab. And all other Labs. of the Department.	16 (2-Ton split)	0.5	8	
3	Requirement of Cabinets in the corridor and common areas of the department to keep and display Student's Projects.		2	2	
6	Requirement of Rack for each floor. To keep student's bags.	2	1	2	
7	For Departmental library/reading room:- 1. 4 nos. of bookshelf. 2. Furniture. 3. One desktop PC.	1	2	2	

### C. Laboratory Common Up gradation :-

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	High configuration PC for each Lab	8	0.5	4	
2	seating facility for faculty/Technical Assistant in each Lab	8	0.3	2.4	
3	Storage rack for each Lab (Large size)	8	0.3	2.4	
4	Projector for each Lab.	8	0.5	4	
5	200 nos. transparent plastic containers (1 Ltr.) to keep Electronic components.	200		0.1	
6	Requirement of 20 nos. of DSO	20	0.5	10	
7	Maintenance tools for Laboratory Equipments		1.5	1.5	

### D. Establishment of New Laboratory:-

● **Establishment of Project and R&D Lab. It is required**

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	One double sided PCB design machine,	1	10	10	For student's & teacher's Project cum research work
2	DC regulated power supply	10	0.3	3	For student's & teacher's Project cum research work
3	Soldering and De-soldering Station	2	0.5	1	For student's & teacher's Project cum research work
4	DSO	2	0.5	1	For student's & teacher's Project cum research work
5	Function Generator	2	0.2	0.4	For student's & teacher's Project cum research work
6	Bench top multimeter	5	0.10	0.50	For student's & teacher's Project cum research work
7	LED fitted magnifying glass	2	0.1	0.20	For student's & teacher's Project cum research work

• **Speech Processing Lab. It is required –**

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	DSP board	5		3	For student's experimental study
2	Multi-channel audio acquisition and storage device,	2		2	For student's experimental study
3	Microphone array,	5		0.5	For student's experimental study
4	ADSP 21XX/TMS320C6XXX DSP Trainer Kit,	5		2.5	For student's experimental study
5	Multi- channel Biomedical Signal Acquisition System,	1		3	For student's experimental study
6	TMS320C6XXX CPU(Texas Instruments),	5	0.4	2	For student's experimental study

## E. Modernization of Laboratory

### 1. Modernization of Instrumentation and control Lab:-

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	Extension of Work bench.			5	For keeping the equipments
2	Experiment kit for pressure measurement.	5	0.5	2.5	For student's experimental study
3	Experiment kit for Displacement measurement (LVDT kit).	5	0.2	1	For student's experimental study
4	Experiment kit for Temperature measurement.	5	0.2	1	For student's experimental study
5	Experiment kit for Speed measurement	5	0.2	1	For student's experimental study
6	Experiment kit for Light measurement.	5	0.2	1	For student's experimental study
7	Experiment kit for Data conversion (ADC & DAC)	2	0.5	1	For student's experimental study
8	DCS and SCADA trainer kit.	2	0.70	1.4	For student's experimental study
9	Experiment kit for PMMC function.	5	0.30	1.5	For student's experimental

					study
10	Experiment kit for Strain measurement.	5	0.2	1	For student's experimental study
11	Data interfacing trainer kit.	5	0.2	1	For student's experimental study
12	Experiment kit for Vibration measurement.	5	0.2	1	For student's experimental study
13	Digital multimeter (DMM) trainer kit.	5	0.30	1.5	For student's experimental study
14	Experiment kit for Sound measurement.	5	0.2	1	For student's experimental study
15	Experiment kit for Proximity measurement.	5	0.2	1	For student's experimental study
16	Experiment kit for Photo-electric effect.	5	0.2	1	For student's experimental study
17	Requirement of sensor components:- 1. Capacitive Proximity Sensor (30 nos.), 2. Hall Effect Sensor (30 nos.), 3. Infrared Sensor (30 nos.) 4. Pressure Sensor (30 nos.) 5. Photodiode (30 nos.), 6. Thermocouple (30 nos.), 7. Thermistor (30 nos.), 8. Photo transistor (30 nos.)			2	For student's experimental study
19	Breadboard	30	500	0.15	For student's experimental study
20	PLC trainer kit.	2	0.50	1	For student's experimental study

## 2. Modernization Electronic devices and circuits Lab:-

Sl No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	Breadboards for electronic device lab,	30		0.25	For student's experimental study
2	OP-AMP trainer kit.	6	0.1	0.6	For student's experimental study
3	RF Spectrum Analyzer (1.8GHz/6 GHz),	3	1	3	For student's experimental study
4	One Vector Network Analyzer (6GHz/12 GHz),	1	1	1	For student's experimental study
5	Vector Signal Generator (6 GHz)	2	1	1	For student's experimental study
6	LCR Meter,	2		2	For student's

					experimental study
13	RF Power Meter	2		2	For student's experimental study
14	Logic Analyzer (16 & 34 channels),	2	.5	1	For student's experimental study
15	Pulse generator (150 MHz)	5		1	For student's experimental study
16	Synthesized RF Generator (2 GHz),	2		1	For student's experimental study

### 3. Modernization Of digital logic design Lab:-

SI No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	Encoder and decoder trainer kit.	6	0.1	0.6	For student's experimental study
3	Half Adder and Full Adder trainer kit,	6	0.1	0.6	For student's experimental study
4	Logic gate Trainer kit,	6	0.1	0.6	For student's experimental study
5	Digital Logic Family trainer kit.	6	0.1	0.6	For student's experimental study
6	RAM, ROM memory trainer kit.	6	0.1	0.6	For student's experimental study
7	Multiplexer and DE multiplexer trainer kit.	6	0.1	0.6	For student's experimental study
8	Flip-Flop trainer kit.	6	0.1	0.6	For student's experimental study
9	Counter trainer kit	6	0.1	0.6	For student's experimental study
10	Register trainer kit.	6	0.1	0.6	For student's experimental study

### 4. Modernization Of digital logic design Lab:-

SI No	Name & brief Description of equipment/ Items	Quantity	Approx cost (per item excluding taxes)(in lacs)	Approx total cost (in lacs)	Remarks
1	8085 trainer kit,	30		2	For student's experimental study
3	8086 trainer kit,	30		2	For student's experimental study
4	8051 trainer kit	30		2	For student's experimental study

## F. Faculty and Staff Development

Faculty and Staff Development (including faculty qualification up gradation, pedagogical training, and organizing/participation of faculty in workshops, seminars and conferences) for improved competence.

Estimated budget:	2017-18	2018-19	2019-20
	5 Lakhs	10 Lakhs	5 Lakhs

## G. Starting new PG and PhD programmes.

Estimated budget:	2017-18	2018-19	2019-20
	-	-	10 Lakhs

AICTE has made mandatorily to have at least 01-NBA accreditation program to start another 01-engineering program in the institution. After obtaining NBA accreditation, department has planned to add following programs:

- M. Tech in Electronics and Engineering with intake of 18+ 5\* (\*sponsored seats) from the academic session 2018-2019.

## H. Improving employability of the students

Estimated budget:	2017-18	2018-19	2019-20
	2 Lakhs	5 Lakhs	5 Lakhs

To Promote Industry-department interaction the following action will be taken:

- Establishment of Industry-department Partnership /interaction Cell.
- Organizing Workshops, conferences and symposia with joint participation of the faculty and the industries.
- Encouraging engineers from industry to visit department to deliver lectures.
- Participation of experts from industry in curriculum development.
- Arranging visits of staff members to various industry
- Professional consultancy by the faculty to industries.
- Industrial testing by faculty & technicians at site or in laboratory.
- Joint research programs and field studies by faculty and people from industries.
- Visits of faculty to industry for study and discussions or delivering lectures on subjects of mutual interest.
- Visits of industry executives and practicing engineers to the Institute for seeing research work and laboratories, discussions and delivering lectures on industrial practices, trends and experiences.
- Memoranda of Understanding between the department and industries to bring the two sides emotionally and strategically closer.
- Human resource development programs by the faculty for practicing engineers. Collaborative degree programs. Short-term assignment to faculty members in industries. Visiting faculty/professors from industries. Professorial Chairs sponsored by industries at the Institute. R&D Laboratories sponsored by industries at the Institute.

Scholarships/fellowships instituted by industries at the Institute for students. Practical training of students in industries.

## I. GATE preparation

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	11 lakhs	15lakhs	15 lakhs

Sl. No	Description of particulars	Quantity	Approx Total Cost per year (Lacs)	Approx Total Cost(in lacs)	Justification
1	Guest Faculty members (From IITs and NITs)	6	5	5	Remedial and doubt clearing session
2	GATE coaching	-	12	36	Preparation for exit examination
<b>Total</b>				<b>41</b>	

## MECHANICAL ENGINEERING DEPARTMENT

### Expected Outcomes:

**1. Department is getting strengthened by:**

- a. 100 percent eligible UG accredited within 4 years.
- b. 100 percent trained institutional officials and senior faculty for increasing internal and external efficiency of the institution.
- c. At least 10 MoUs with Reputed Institutions and Industries.
- d. 100 percent overall students, faculty and parent satisfaction by conducting survey.

**2. Human Resources-Faculty and Staff:**

- a) 100 percent Faculty members with M.Tech and as many PhD Qualifications as possible drawn from industries, R&D organizations and academics.
- b) 10 percent of external revenue from Training, Research and Consultancy projects.
- c) At least 02 publications in refereed national and international journals by each faculty in every year.

**3. Human Resources – Students:**

- a. Increase percentage placement rate for UG students from 55% to 80%.
- b. Attract high payment companies by consistent efforts.



- c. Improvement in the academic performance of SC, ST, BC and other academically weak students from 55 percent to 90 percent.
- d. Increase in transit rate from 1<sup>st</sup> to 2<sup>nd</sup> year for all the students from 60 percent to 90 percent.

#### 4. Departments:

- a. Get existing UG laboratories modernized and strengthened.
- b. Get advanced equipments for training, research and consultancy as per latest industry requirements.
- c. Continuously upgrade learning and research facilities with project funds.

**1.0 Faculty and Staff Development (including faculty qualification upgradation, pedagogical training, and organizing/participation of faculty in workshops, seminars and conferences) for improved competence.**

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>02 lakhs</b>	<b>05 lakhs</b>	<b>05 lakhs</b>

**Improving the learning outcomes of the students:**

**1.1 Faculty training (qualification upgradation, subject upgradation & research competence, Pedagogical training, participation in conferences, seminars/workshops etc.)**

The strength of Mechanical Engineering Department lies in its highly dedicated and motivated faculty members. The department has 09 nos. of faculty possessing M.Tech degree who will be sponsored from TEQIP funds:

- For upgradation of qualification and facilitating their individual research work and computational skills.
- For improving Teaching, Learning & Research Competencies.

Faculty members will be supported for attending various seminars, conferences, workshops refresher and orientation courses to enhance their skills. The following activities shall be carried out:

- Training in pedagogy and management capacity development.
- Training in content up-gradation (both in-house and outside).
- Faculty deputation for Ph.D programme and higher studies.
- Encouraging and sponsoring faculty for workshops and conferences
- Providing training to technical, support and administrative staff in selected areas (both in-house and outside)

### **1.1.1 Basic and advanced pedagogy training**

Basic and Advance pedagogy training programmes shall be arranged in the department so that knowledge domain of the faculty members can be upgraded.

The following steps will be taken:

- Basic and advanced pedagogy trainings shall be organized in the department.
- Subject /domain knowledge enhancement programs.
- Participating in activities such as workshops, seminars etc by the faculty members.
- Improvement in faculty qualifications by sponsoring faculty members for qualification up gradation.
- Improving research capabilities

### **1.1.2 Subject / domain knowledge enhancement**

To enhance subject knowledge of faculty members and students, the following activities will be undertaken during this project:

- Atleast four nos. of workshops/conferences/STC shall be organized by the Department during TEQIP-III project.
- Conducting training programmes for improving efficiency, governance, productivity and responsiveness.
- Conducting continuous training programmes for basic and advanced pedagogy and domain knowledge enhancement.
- Encouraging faculty participation in conferences, workshops and seminars
- Arranging qualification improvement programmes for faculty.
- Organizing programmes for exposing professional ethics.
- Registering Online courses like MOOC Coursera, FutureLearn, edX offered by IITs and Ivy League universities.

### **1.1.3 Increasing participation in activities such as workshops, seminars, etc.**

To motivate the faculty members for attending workshop, seminars, conference etc. the following activities will be undertaken:

- Faculty members shall be sponsored to attend workshop/seminar/conference/FDPs in other institutions.
- In-house subject related workshop/seminar/conference/FDPs by all department will held.
- TA/DA/Boarding & Lodging as per TEQIP-III rules for attending workshop/seminar/conference/FDPs in other institutions will be reimbursed.

### **1.1.4 Improvement in faculty qualifications.**

The department has nine nos. faculty members having M.Tech degree will be sponsored for qualification up gradation under TEQIP project.

- Faculty members possessing M.Tech degree shall be sponsored to IITs, NITs and other premier institutions of the country for qualification upgradation.
- If faculty is enrolled for qualification upgradation either through full-time or part-time or by sandwich joint arrangement other than the parent Institution fees charged for course work, registration fee etc., use of research facilities, consumables, expenses towards thesis printing and publication of thesis-based research papers will be paid from respective head.
- If faculty is registered for qualification upgradation on full-time or part-time basis within the parent Institution expenses related to consumables, thesis printing and publication of thesis-based research papers will be paid from allocated fund.

### 1.1.5 Staff training (Technical & Administrative staff)

Technical and Administrative staff shall be deputed to undergo training to enhance capability in their domain work in reputed institutes offering such training programmes. The following areas are broadly identified in which the training are proposed:

- Medium and short term training courses are proposed in their domain areas (like Fluid, Thermal, Design, Manufacturing, Production, Industrial, Automobile, common software packages like MATLAB, ANSYS, AUTOCAD and repair & maintenance of lab equipment etc).
- Further the technical and support staff are to be trained for supervisory and skill development in using state of the art equipment and technology.
- Medium and short term training programs for newly appointed technical staff to carry out routine laboratory tests as per international standards.
- Medium and short term training courses are proposed in office automation.
- Communication skills Training Programs for instructors shall be organized within the Institution.
- Carry out on-the-job training for both technical and non-technical staff within and outside the institute.
- Further, the institute intends to impart training and send the staff for outside training during summer and winter vacation so that the academics activities may not be affected.
- In addition to training in the field of one's specialization/trade, the department intends to give basic exposure of computer operation to all staff (technical and non-technical) of the institute.

## 2. Departmental Development Proposal for TEQIP Phase III

Sr. No	Name and Brief Description of equipment	Qty.	Rate (Rs)	Approx. Cost (Rs)	Justification
1	Generator	1	500000.00	500000.00	official purpose
2	Xerox cum Printer cum Scanner	1	100000.00	100000.00	official purpose
3	Air Conditioning of laboratories for 03 nos laboratories	08 Nos	70,000.00	5,60,000.00	Laboratory Purpose
4	Smart Class Room	3	500000.00	1500000.00	Teaching- learning purpose
<b>TOTAL</b>				<b>26,60,000.00</b>	

### 3. Upgradation of library and learning resources ( Books, E-books and E- journals):

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>10 lakhs</b>	<b>10 lakhs</b>	<b>10 lakhs</b>

### 4. Upgradation of Existing Laboratory

#### A. Engine Lab

Name of the Equipment	Quantity	Rate	Total Cost (INR)	Justification
Flue gas analyzer for NOx, SOx, CO, CO2 and soot	1	2,00,000/-	2,00,000/-	To study emission norms of IC engine
Smoke meter	1		50,000/-	To study smoke emission of IC engine

#### B. Strength of Materials laboratory

Name of the Equipment	Quantity	Rate	Total Cost(INR)	Justification
Dynamic load testing machine with furnace	1	20,000,00	20,000,00/-	To evaluate various mechanical properties of materials under different conditions

### 5 Starting PG and PhD programmes.

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	-	<b>10 lakhs</b>	<b>10 lakhs</b>

AICTE has made mandatorily to have at least 01-NBA accreditation programme to start another 01- engineering programme in the institution. After obtaining NBA accreditation, department has planned to introduce/ reintroduce the following programme:

- The already approved M.Tech programme in Fluid Thermal & Energy shall be reintroduced.

### 6 Upgradation of Learning Resources

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>10 lakhs</b>	<b>5 lakhs</b>	<b>5 lakhs</b>

#### 6.1.1 Investing in smart classrooms, campus Wi-Fi (24\*7 broadband connectivity and Wi-Fi access in all academic buildings (with a minimum of 2 MBPS speed for each connection))

Department has 01- smart class room with the seating capacity of 60. Online classes, NPTEL lectures, ICT based short term courses are being organized in this smart class room. Institution is planning to develop 03 more smart class rooms under TEQIP-III project as per detail below

One smart class room in each year classes with seating capacity of 60 students.

- All modern facilities like laptops, wireless projectors, LCD screen for video conferencing, Wi-Fi connections will be established in these smart class rooms.

- At present, the department has **100 mbps** speed lease line from NKN to provide internet facility through broadband connection to faculty, staff and students of the department. In addition to this, department is planning to take **50 mbps** additional Internet Back up from other service providers.
- Planning and Installation of IP based cameras or non IP Based Cameras in Computer laboratories. Smart class and campus for security and surveillance purpose.
- Air Conditioning system for server room and networking devices.
- UPS with batteries for electricity backup for computers in Computer laboratories and other planned smart class rooms.
- Software License Renewal, Laptops, Printers for faculty members and in labs and Portable Hard Disks.

#### 7. Procurement of furniture

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>24 lakhs</b>	<b>10 lakhs</b>	<b>10 lakhs</b>

#### 8. (Minor Civil Works)

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>5 lakhs</b>	<b>10lakhs</b>	<b>10 lakhs</b>

#### 9. GATE preparation

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>5 lakhs</b>	<b>10lakhs</b>	<b>10 lakhs</b>

Sl. No	Description of particulars	Quantity	Approx Total Cost per year (Lakhs)	Approx Total Cost(in lakhs)	Justification
1	Guest Faculty members	6	3	9	Remedial classes and doubt clearing session

#### 10. Improving employability of the students

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>10 lakhs</b>	<b>7 lakhs</b>	<b>7 lakhs</b>

##### 10.1 Increasing interaction with industry

To Promote Industry-department interaction the following action will be taken:

- Establishment of Industry-department Partnership /interaction Cell.
- Organizing Workshops, conferences and symposia with joint participation of the faculty and the industries.
- Encouraging engineers from industry to visit department to deliver lectures.
- Participation of experts from industry in curriculum development.
- Arranging visits of staff members to various industry
- Professional consultancy by the faculty to industries.
- Industrial testing by faculty & technicians at site or in laboratory.

- Joint research programmes and field studies by faculty and people from industries.
- Visits of faculty to industry for study and discussions or delivering lectures on subjects of mutual interest.
- Visits of industry executives and practising engineers to the Institute for seeing research work and laboratories, discussions and delivering lectures on industrial practices, trends and experiences.
- Memoranda of Understanding between the department and industries to bring the two sides emotionally and strategically closer.
- Human resource development programmes by the faculty for practising engineers. Collaborative degree programmes. Short-term assignment to faculty members in industries. Visiting faculty/professors from industries. Professorial Chairs sponsored by industries at the Institute. R&D Laboratories sponsored by industries at the Institute. Scholarships/fellowships instituted by industries at the Institute for students. Practical training of students in industries.

### **10.2 Student career counseling and placement:**

The career counselling provides consultation for academic, personal, social and vocational development, to assist students in analyzing interests, aptitudes, personal traits, values, attitudes and desired lifestyles for suitable employment and educational opportunities. The office provides support for faculty, staff, and administration on the employment trends, standards, and requirements, affecting the particular office or department. Institution has designated faculty members to counsel students of each class on regular basis. These faculty member helps students in academic planning for college and career readiness, enrichment and extracurricular engagement among the students.

- Expenditure towards inviting industry (excluding travel cost and lodging boarding) for campus interviews and hospitality during campus interviews.
- Tutoring by industry experts to prepare students for on- and off-campus job interviews.

### **10.3 Improving transition rates of all categories of students and improving non-cognitive skills of students**

- Honorarium to faculty and staff for taking induction training, bridge Courses, remedial teaching classes, induction training and skill development training Transportation charges of students visits, if any Honorarium, TA and DA to outside experts for specialized training in soft components including communication - presentation skills GATE Registration fee (only for final year students).
- Honorarium, TA and DA to outside experts for GATE orientation programmes and specialized GATE training classes.
- Honorarium, TA and DA to outside experts for specialized training in Finishing School Consultancy services procured for technical assistance related to knowledge/skill enhancement for weak students and establishing a Finishing School.

-----XXXXX-----

## **DEPARTMENT OF PETROLEUM ENGINEERING**

### **Expected Outcomes:**

#### **1. Department is getting strengthened by:**

- a) 100 percent eligible UG accredited within 4 years.
- b) 100 percent trained institutional officials and senior faculty for increasing internal and external efficiency of the institution.
- c) At least 10 MoUs with Reputed Institutions and Industries.
- d) 100 percent overall students, faculty and parent satisfaction by conducting survey.

#### **2. Human Resources-Faculty and Staff:**

- a) 100 percent Faculty members with M.Tech and as many PhD Qualifications as possible drawn from industries, R&D organizations and academics.
- b) 10 percent of external revenue from Training, Research and Consultancy projects.
- c) At least 02 publications in refereed national and international journals by each faculty in every year.

#### **3. Human Resources – Students:**

- a. Increase percentage placement rate for UG students.
- b. Attract high payment companies by consistent efforts.
- c. Improvement in the academic performance of SC, ST, OBC and other academically weak students.
- d. Increase in transit rate from 1<sup>st</sup> to 2<sup>nd</sup> year for all the students.

#### **4. Departments:**

- a. Get existing UG laboratories modernized and strengthened.
- b. Get advanced equipments for training, research and consultancy as per latest industry requirements.
- c. Continuously upgrade learning and research facilities with project fund

#### **1.1 Faculty training (qualification upgradation, subject upgradation & research competence, Pedagogical training, participation in conferences, seminars/workshops etc.)**

Department Petroleum Engineering has very young and dynamic faculty members is strength of the department. The faculty members of the department shall be encouraged to attend conferences, seminars/workshops etc. so that subject knowledge of the faculty members can be enhanced. The following activities shall be carried out:

- Training in pedagogy and management capacity development.
- Training in content up-gradation (both in-house and outside).
- Faculty deputation for Ph.D. programme and higher studies.
- Encouraging and sponsoring faculty for workshops and conferences

- Providing training to technical, support and administrative staff in selected areas (both in-house and outside)

### **1.1.1 Basic and advanced pedagogy training**

Basic and Advance pedagogy training programmes shall be arranged in the department so that knowledge domain of the faculty members can be enhanced.

The following steps will be taken:

- Basic and advanced pedagogy trainings shall be organized in the department.
- Subject / domain knowledge enhancement programmes.
- Attendance in activities such as workshops, seminars, etc. by the faculty members.
- Improvement in faculty qualifications for sponsoring faculty members for qualification up gradation.
- Improving research capabilities

### **1.1.2 Subject / domain knowledge enhancement**

To enhance subject knowledge of faculty members and students, the following activities will be undertaken during this project:

- Conducting 04 workshops/conferences/STC by the Department during TEQIP-III project.
- Conducting training programmes for improving efficiency, governance, productivity and responsiveness.
- Conducting continuous training programmes for basic and advanced pedagogy and domain knowledge enhancement.
- Enhancing number of participation in conferences, workshops and seminars
- Arranging qualification improvement programmes for faculty.
- Organizing programmes for exposing professional ethics.
- Registering Online courses offered by renowned institutions.

### **1.1.3 Attendance in activities such as workshops, seminars, etc.**

To enhance attendance of faculty members in workshop, seminars, conference etc. the following activities will be undertaken:

- Faculty members shall be sponsored to attend workshop/seminar/conference/FDPs in other institutions.
- Subject related workshop/seminar/conference/FDPs by all department shall be organized with in institution.
- To enhance attendance, faculty members shall be paid TA/DA/Boarding & Lodging as per TEQIP-III rules for attending workshop/seminar/conference/FDPs in other institutions.



#### 1.1.4 Staff training (Technical & Administrative staff)

Technical and Administrative staff shall be deputed to undergo training to enhance capability in their domain work in reputed institutes offering such training programmes. The following areas are broadly identified in which the training are proposed:

- Medium and short term training courses are proposed in their domain areas.
- Further the technical and support staff are to be trained for supervisory and skill development in using state of the art equipment and technology.
- Medium and short term training programs for newly appointed technical staff to carry out routine laboratory tests as per international standards.
- Medium and short term training courses are proposed in office automation.
- Communication skills Training Programmes for instructors shall be organized within the Institution.
- Carry out on-the-job training for both technical and non-technical staff within and outside the institute.
- Further, the institute intends to impart training and send the staff for outside training during summer and winter vacation so that the academics activities may not be affected.
- In addition to training in the field of one's specialization/trade, the department intends to give basic exposure of computer operation to all staff (technical and nontechnical) of the institute.

#### 1.2 Overall Budgets:

##### A. Departmental Development Proposal for TEQIP Phase III

Sr. No	Name and Brief Description of equipment	Qty.	Rate (Rs)	Approx. Cost (Rs)	Justification
1	Software (Simulation software)	-	5000000.00	5000000.00	Teaching/class purpose
2	Furnishing Seminar Hall	-	2000000.00	2000000.00	Modernization of seminar hall
3	Generator	1	500000.00	500000.00	official purpose
4	Common room furniture		200000.00	200000.00	Upgradation of common room
5	Xerox cum Printer cum Scanner	1	100000.00	100000.00	official purpose
6	Electronic display board	1	30000.00	30000.00	official purpose
7	Air Conditioning of laboratories for 02 nos laboratories	08 Nos	70,000.00	5,60,000.00	Laboratory Purpose
8	Chair Professor from Oil Industries	1	60,00000.00	60,00000.00	Teaching- learning purpose
9	Guest Faculty members	5	10000000.00	10000000.00	Teaching- learning purpose
10	Smart Class Room	3	500000.00	1500000.00	Teaching- learning purpose
<b>TOTAL</b>				<b>2,58,90,000.00</b>	

## B. Departmental Laboratory Equipment and Accessories development Proposal:

Sr. No	Name and Brief Description of equipment	Qty.	Rate (Rs)	Approx. Cost (Rs)	Justification
1	Sieving machine (with sieves)	1	40000.00	40000.00	Laboratory purpose
2	Agate Mortar	2	25000.00	50000.00	Laboratory purpose
3	Leica Microscope with camera attachment.	2	2000000.00	4000000.00	Laboratory purpose
4	Core Flooding Equipment and it's accessories	1	5000000.00	5000000.00	Laboratory purpose
5	Contact Angle Measuring Equipment and it's accessories	1	2000000.00	2000000.00	Laboratory purpose
6	Centrifuge	1	500000.00	500000.00	Laboratory purpose
7	High Pressure – High Temperature Rheology Meter	3	700000.00	2100000.00	Laboratory purpose
8	Analogue Rheology Meter	1	400000.00	400000.00	Laboratory purpose
9	End Facing Machine	1	600000.00	600000.00	Laboratory purpose
10	Mud – Mixture	2	1000000.00	2000000.00	Laboratory purpose
11	Interfacial Tension (IFT) Measuring Equipment and one high configuration desktop	1	1600000.00	1600000.00	Laboratory purpose
12	Digital Vernier Calliper	2	4000.00	8000.00	Laboratory purpose
13	Soxhlet apparatus set	2	400000.00	800000.00	Laboratory purpose
14	High Pressure and Temperature Filter Press	2	2300000.00	4600000.00	Laboratory purpose
15	Immersion Oil for Microscope	3(20ml each)	800.00	2400.00	Laboratory purpose
16	Automatic Water Distiller	1	75000.00	75000.00	Laboratory purpose
17	Drilling fluid lubricity meter	1	300000.00	300000.00	Laboratory purpose
18	Ultimate Analyzer	1	2500000.00	2500000.00	Laboratory purpose
19	Proximate Analyzer	1	2500000.00	2500000.00	Laboratory purpose
20	Gas content volume measuring equipment.	1	5000000.00	5000000.00	Laboratory purpose
21	Coal gasification equipment	1	1000000.00	1000000.00	Laboratory purpose
<b>TOTAL</b>				<b>3,54,35,400.00</b>	

### 1.3. Activity Title: Faculty and Staff Development:

#### a. Pedagogical training/Subject domain training/ICT and Teaching Content Development Training ( Participating and Organizing )

<b>Year</b>	<b>Budget</b>
2017-2018	03 Lacs
2018-2019	04 Lacs
2019-2020	05 Lacs
<b>Total</b>	<b>12 Lacs</b>

#### b. Attending and Organizing National Seminar/workshop/conference

<b>Year</b>	<b>Budget</b>
2017-2018	01 Lacs
2018-2019	01 Lacs
2019-2020	01 Lacs
<b>Total</b>	<b>03 Lacs</b>

#### c. Attending International Seminar.

<b>Year</b>	<b>Budget</b>
2017-2018	02 Lacs
2018-2019	04 Lacs
2019-2020	04 Lacs
<b>Total</b>	<b>10 Lacs</b>

#### d. Staff Training (Technical & Administrative)

<b>Year</b>	<b>Budget</b>
2017-2018	01 Lac
2018-2019	01 Lac
2019-2020	01 Lac
<b>Total</b>	<b>03 Lacs</b>

## 1.4 Equity Action Plan

Sl. No	Items	Action	Implementation Agency	Frequency	Monitoring Indicators
(i)	To identify weakness in all students and take remedial steps	At the beginning of each semester students will be screened according to the performance in the previous semester exam and special coaching classes as well as extra tutorial classes will be arranged for the weak students.	Project institutions	Every month a test will be conducted to evaluate the performance of these students.	Performance in the test.
(ii)	To improve language competency, soft skills and confidence levels.	A provision of special tutor is being made exclusively for this purpose.	Project institution	Continuous	Better transition rates for first and second year student
(iii)	Institution to improve non-cognitive and soft skills including communication and presentation skills through their wide use in curricula/ project based work, and where needed, to provide special skills training to students with priority to the weak students.	It has been already included in the university curriculum.	Project institution	Continuous	Improvement in job placement of students, especially among those with weak backgrounds.
(iv)	Give under qualified teacher priority in opportunities to upgrade their domain knowledge.	Institute will encourage to upgrades its faculty to pursue higher studies under QIP and other government schemes.	Project institutions and SPIUs.	Yearly	Increase in the percentage of teachers enrolled in Ph.D. and P.D.F. reported yearly
(v)	Training of teachers in subject matter and pedagogy, particularly to improve the performance of students	Institute will encourage its faculty to attain such programs at institute of high learning like IITs and NITs. Institute will arrange FDP for their faculty in the area of pedagogy, domain training.	Project institutions and SPIUs	TNA will be done.	Percentage of planned training completed as reported/aggregate 6 monthly
(vi)	Make campus physically and socially gender - friendly; especially provide adequate and suitable facilities to women students and faculty	Sufficient area for girls common and ladies washroom will be provided at appropriate locations.	Project institution	At the time of IDP and actions implemented as proposed	Institutions to provide descriptive report of action taken including number of beneficiaries.

(vii)	Hold innovation and knowledge sharing Workshops yearly to improve knowledge sharing	Every year one workshop/seminar/ conference of national/ international level will be organized to share the academic as well as research knowledge.	-	Yearly	Institution to provide descriptive reports of actions taken including number of beneficiaries.
(viii)	Sharing information and knowledge about engineering courses and institutions	Every semester such awareness program will be organized.	State govt. Dept. dealing with secondary and technical education.	Yearly	Nearby school will be benefited
(ix)	Provide appropriate infrastructure for physically challenged students.	Provision of ramp in appropriate location of building is being done as well as two number of toilet for male and two numbers for female are proposed to be updated for differently able people.	Project institutions.	As required	It is mandatory from the point of view of AICTE/UGC requirement.
(x)	Special effort for training /internship/ placement of weak students	Industry institute linkage will be strengthening by operating a separate cell.	Project institutions through TPO	Continuous	TPO will provide data.
(xi)	Ensure that institutional mechanisms to protect and address the needs and concern of women students are established.	It already exists.	-	continuous	The concern committee will provide data
(xii)	Develop a standard model for tracking of student progress	It has already being implemented to monitor the student progress	Project institutions	continuous	Monitoring will be done by the teachers as well as students.
(xiii)	Peer learning Groups of students	Institute has already taken initiative by involving its alumni to guide our student's project.	Project institutions	continuous	All HOD in associate TPO will provide data for students benefitted.
(xiv)	Appointing student mentor and faculty advisers for students	It already exists.	Project institutions	continuous	Result will be monitored.

### 1.5 Details of activities to be performed under academic reforms:

- MIS/ERP will be introduced for monitoring and regulating student related, faculty and employee related aspects.
- Implementation teaching diary for teacher to record the performance of student including lesson plan.
- Introducing mentorship for the student to solve their academic as well as non-academic problems.

- Training of teaching faculties and supporting laboratory staff to update their knowledge and enhance capability.
- Occasional training of student to impart them practical knowledge related to their specialization.
- Allowing faculty and student members to participate in national/ international conference/ seminar/workshop for enhancing their exposure to academics and research.
- Promoting internal revenue generation of institute with the help of higher institute.
- Arranging frequent guest lecturers of the speakers from higher learning institutes and industries.
- Arranging special coaching classes for ST/SC and academically weak students and special classes for GATE/ PS exam.
- Strengthening the existing feedback system of the students regarding courses they are being taught to improve the teaching learning process.

#### 1.6 Starting new PG and PhD programs:

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	-	-	<b>20 lakhs</b>

AICTE has made mandatorily to have at least 01-NBA accreditation programme to start another 01- engineering programme in the institution. After obtaining NBA accreditation, department has planned to add following programmes:

- M. Tech in Petroleum Engineering.
- Ph.D. in Petroleum Engineering

#### 1.7 Upgradation of Learning:

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>02 lakhs</b>	<b>05 lakhs</b>	<b>05 lakhs</b>

#### 1.8 Improving employability of the students

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>02 lakhs</b>	<b>05 lakhs</b>	<b>05 lakhs</b>

#### 1.9 GATE preparation

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>11 lakhs</b>	<b>15lakhs</b>	<b>15 lakhs</b>

Sl. No	Description of particulars	Quantity	Approx Total Cost per year (Lacs)	Approx Total Cost(in lacs)	Justification
1	Guest Faculty members (From IITs and NITs)	6	5	5	Remedial and doubt clearing session
2	GATE coaching	-	12	36	Preparation for exit examination
	<b>Total</b>			<b>41</b>	

### **1.10 Increasing interaction with industry**

To Promote Industry-department interaction the following action will be taken:

- Establishment of Industry-department Partnership /interaction Cell.
- Organizing Workshops, conferences and symposia with joint participation of the faculty and the industries.
- Encouraging engineers from industry to visit department to deliver lectures.
- Participation of experts from industry in curriculum development.
- Arranging visits of staff members to various industry
- Professional consultancy by the faculty to industries.
- Industrial testing by faculty & technicians at site or in laboratory.
- Joint research programmes and field studies by faculty and people from industries.
- Visits of faculty to industry for study and discussions or delivering lectures on subjects of mutual interest.
- Visits of industry executives and practicing engineers to the Institute for seeing research work and laboratories, discussions and delivering lectures on industrial practices, trends and experiences.
- Memoranda of Understanding between the department and industries to bring the two sides emotionally and strategically closer.
- Human resource development programmes by the faculty for practicing engineers. Collaborative degree programmes. Short-term assignment to faculty members in industries. Visiting faculty/professors from industries. Professorial Chairs sponsored by industries at the Institute. R&D Laboratories sponsored by industries at the Institute. Scholarships/fellowships instituted by industries at the Institute for students. Practical training of students in industries.

### **1.11 Student career counseling and placement:**

The career counselling provides consultation for academic, personal, social and vocational development, to assist students in analyzing interests, aptitudes, personal traits, values, attitudes and desired lifestyles for suitable employment and educational opportunities. The office will provide support for faculty, staff, and administration on the employment trends, standards, and requirements, affecting the particular office or department. Institution has designated faculty members to counsel students of each class on regular basis. These faculty member helps students in academic planning for college and career readiness, enrichment and extracurricular engagement among the students.

- Expenditure towards inviting industry (excluding travel cost and lodging boarding) for campus interviews and hospitality during campus interviews.
- Tutoring by industry experts to prepare students for on- and off-campus job interviews.

### **1.12 Improving transition rates of all categories of students and improving non-cognitive skills of students**

- Honorarium to faculty and staff for taking induction training, bridge Courses, remedial teaching classes, induction training and skill development training Transportation charges of students visits, if any Honorarium, TA and DA to outside experts for specialized training in soft components including communication - presentation skills GATE Registration fee (only for final year students).
- Honorarium, TA and DA to outside experts for GATE orientation programmes and specialized GATE training classes.
- Honorarium, TA and DA to outside experts for specialized training in Finishing School Consultancy services procured for technical assistance related to knowledge/skill enhancement for weak students and establishing a Finishing School.

### **1.13 Sponsored research, consultancy and other revenue generating activities:**

<b>Estimated budget:</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>
	<b>02 lakhs</b>	<b>05 lakhs</b>	<b>05 lakhs</b>

#### **1 . 1 4 Sponsored research:**

The department encourages investigation of basic and applied areas of science and technology, and high end technology development in the form of sponsored projects. Research grants for such projects are given by government agencies and industries (both national and international). These projects are usually of 2-5 years duration with periodic appraisals, while research objectives and goals may be refined along the way.

#### **1.15 Collaborative Projects:**

Faculty may also participate in collaborative projects with other domestic or foreign partners. In such projects, even though there may be an overall project, there must be a separate budget and scope of work statement to be done by the faculty and staff of the department. The summary statement provided to the department should be based primarily on the portion to be done by the department. The department will treat this like any other sponsored project.

#### **1.16 Consultancy and other revenue generating activities:**

Consultancy work can be taken up to solve problems refereed by industries, institutions, government agencies and corporations, societies and any other bodies, including professionals/individuals wherein the professional expertise and knowledge of the faculty members (Consultants) as well as the infrastructural facilities of the department will be utilized. The facilities of the department will be used for the research work, theoretical analysis or experimentation required for generating and validating information in solving the industrial problems. The assignments are heavily dependent on the existing know-how and skill of the faculty members involved. By creating state of art facilities in all disciplines, consultancy services shall be provided to industries, institutions, government agencies and corporations, societies in future also.



**The fund under this heading can be utilize for payment towards:**

- Publication of research papers in refereed journals available on Web of Science for faculty/ students.
- Commercialization of research products patenting of research products.
- Travel cost, hospitality and honorarium paid to experts for participation in Research & Development activities and for delivering expert lectures in the project department.
- Organizing conferences on R&D topics/themes.
- Developing research interest among UG students.
- Fiscal incentive (as per norms approved by the BOS) to students that voluntarily associate with Industry oriented R&D projects.
- Expenses on travel, boarding and lodging of students that associate with an Industry for about 3-4 weeks during vacations to continue work on R&D projects consumables.
- Financial aid to the extent of 20% of total budget in Tech Fest/ project competitions.
- Registration Fees and TA for students participating in Tech Fest of IITs/NITs.
- Seed grant for research to faculty members and / or students to venture into innovative research and to strengthen research culture.
- Appointment of retired teachers from IITs/NITs/other reputed institutions as Senior Research Advisor for enhancement of Research & Development activities.

-----XXXXX