TECHNICAL EDUCATION QUALITY IMPROVEMENTPROGRAMME

(TEQIP)

PHASE-III

INSTITUTIONAL DEVELOPMENT PROPOSAL

For

Sub-component 1.1

Institutional Development for Participating Institute

Submitted by

THDC-INSTITUTE OF HYDROPOWER ENGINEERING & TECHNOLOGY, Tehri Garhwal (THDC-IHET),

UTTARAKHAND–249124

February 2017

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1. INSTITUTIONAL BASIC INFORMATION

1.1. Institutional Identity:

- Name of the Institution : THDC-INSTITUTE OF HYDROPOWER ENGINEERING & TECHNOLOGY, BHAGIRATHIPURAM, TEHRI GARHWAL, UTTARAKHAND, 249124
- Name of the Affiliating University : Uttarakhand Technical University, Dehradun, Uttarakhand
- Is the Institution AICTE approved? : Yes
- Furnish AICTE approval no. : F.No. Northern/1-2812704007/2016/EOA
- Type of Institution : Government
- Status of Institution : Constituent Institute of Uttarakhand Technical University

- Name of Head of Institution:

Head	Names, Designation	Phone Numbers	Mobile Numbers	Fax Numbers	E-mail Addresses
Head of the Institution (Full time appointee)	Dr. G.S. Tomar, Director	01376235432	9425744460	01376235816	gstomar@ieee.org

1.2 Academic Information

- Engineering programmes offered in Academic year 2016-17

Sr. No	Title of Programmes	Level (UG, PG, PhD)	Duration (Years)	Year of starting	AICTE sanctioned annual intake	Total student strength
1.	B.Tech. (Civil Engineering)	UG	4	2011	60	63
2.	B.Tech. (Computer Science & Engineering)	UG	4	2012	60	60
3.	B.Tech. (Electrical Engineering)	UG	4	2011	60	52
4.	B.Tech. (Electronics & Communication Engineering)	UG	4	2011	60	49
5.	B.Tech. (Mechanical Engineering)	UG	4	2011	60	59
6.	M.Tech Electronics Engineering	PG	2	2017 Planned	18	
7.	M.Tech Hydropower Engineering	PG	2	2017 Planned	18	

- **NBA Accreditation Status of UG programmes:**

Title of UG programmes being offered	Whether eligible for Accreditation or not?	Whether accredited as on 31st December 2016?	Whether "Applied for" as on 31st December 2016
B.Tech. (Civil Engineering)	Yes	No	Eligible this year/Applying
B. Tech. (Computer Science & Engineering)	No	No	Not Applicable
B.Tech. (Electrical Engineering)	Yes	No	Eligible this year/Applying
B. Tech. (Electronic and Communication Engineering)	Yes	No	Eligible this year/Applying
B. Tech (Mechanical Engineering)	Yes	No	Eligible this year/Applying

 # The Institute running as per the norms of NBA. Institute look towards applying for NBA Accreditation in session 2017-18.

- **Faculty Status (Regular/On-Contract Faculty as on December 31st, 2016)**

No. of Sanctioned Regular Posts	Present Status : Number in Position by Highest Qualification												Total Number of regular faculty in Position	Total Vacancies	Total Number of contract faculty in Position
	Doctoral Degree				Masters Degree				Bachelor Degree						
	Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and English/ other languages		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and English/ other languages		Engineering Disciplines		Supporting Disciplines (Physics, Chemistry, Maths and English/ other languages				
	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=(2+4+6+8 + 10+12)	15= (1-14)	16= (3+5+7+9+ 11+13)
80	01	01	09	02	03	27	0	0	0	2	0	00	13	67	32

 # On the basis of students and faculty ratio prescribed by AICTE, the Institute forwarded the proposal for creation of 08 Professor, 16 Associate Professor, and 56 Assistant Professor with the state government. The sanction of creation of these posts is expected to be received very soon.

Prof = Professor, Asso. Prof = Associate Professor, Asst. Prof = Assistant Professor, Lec.=Lecturer,

R= Regular, C=Contract

2. INSTITUTIONAL DEVELOPMENT PROPOSAL (IDP)

2.1 EXECUTIVE SUMMARY

The college was established in the year 2011 by THDC India Ltd under CSR scheme and was handed over for running to Government of Uttarakhand, through Uttarakhand Technical University as its Constituent College. The academic session was started with four programs namely, B. Tech. (ECE), B. Tech (M.E), B. Tech (C.E) and B. Tech (E.E). In the year 2012-13 another program B.Tech. (CSE) was added to its strength making five courses of engineering with intake of 60 students each. THDC-IHET give an opportunity of technical education for the student especially for hilly and remote areas of Uttarakhand. College is committed to be center of excellence in the field of engineering and science by integrating the best of teaching, learning, and research. The strategic location of the campus amidst the salubrious environment and the symbiotic connections with the nature. Situated in Bhagirathipuram (Tehri) the institute has a perfect picture post card setting. Institute campus is situated on the tehri to srinagar national highway in a town bhagirathipuram about 13 km from new tehri town, the district head quarter of New tehri district at the bank of Mighty tehri dam and 140 KM away from Drhradun the state capital.

The institute, has emerged as a front runner state of art college of Uttarakhand government offering five undergraduate programmes. The campus is spread over 14 acres and is designed with state of art laboratories having world class academic and research facilities. The library, which foster innovative teaching, learning and personal care to the students.

The college has 43 highly educated and motivated faculty members, out of which 12 faculty members are Ph.D. degree holders. 37 faculty members have post graduate degree out of which 10 are pursuing Ph. D. in their respective field of engineering. Thus, the college is well positioned to create an ambience of education and research. In fact, in the last six years the faculty members have published 160 papers in International Journals, 115 in International Conferences proceedings, 25 in National Journals, 20 in National conference proceedings, 04 **Patents,** 07 **Book chapters** and 10 **books**. Many conferences and seminars have been conducted to educate faculty members and students.

The TEQIP-III is to enhance and strengthening the ongoing efforts of the Government of India to improve quality of Technical Education and improving the existing capacities of the technical institutions to become dynamic, demand driven, quality conscious, efficient and forward looking and responsive at the local, State, National and International levels. The main focus of TEQIP III is to improve the overall quality of existing Engineering Education.

The institution has prepared a Strategic Plan based on SWOT analysis (Strength, Weakness, Opportunity, Threats). The college is ready to implement the provisions of the project at ground level. The strategic plan that has emerged from this reflection aims at making Government Engineering College THDC-IHET more efficient to serve identified national priorities. The current Engineering and technology is continuously carrying out and incorporating ever changing innovations. The students, no doubt are competitive but lacking exposure to the value added basics, an engineer would require. Academic reforms are necessary to instill these skills. THDC-IHET aims at creating engineers, who are not just technically qualified but also have a surplus of life skills to make sure that they use engineering with heart for the benefit of society and country's development as a whole. To meet the demands of upcoming trends, a little freedom in easing the processes and making the mechanism flexible seems inevitable. This would directly help the

students gain freedom and utilize their skills to the fullest and indirectly helps the institution to project its real strengths. The in house availability of students and world's one of the cutting edge technology Tehri dam project is an added advantage for garnering support in the area of energy for young students of the institute.

- **Based on SWOT analysis, provide the strategic plan developed for institutional development.**

Our action plan will range from simple modification of policies and /or administrative measures and introduction of relatively simple technological practices on the one hand, as well as those having expertise of new and emerging complex technologies on the other hand. We would organize all of them in a systematic form with a given time synchronism.

To achieve our commitments, we all are geared up and all committees and sub-committees, as emphasized by the NPIU, have been constituted and have already started their functioning.

To achieve academic excellence, our motive is to build this Institute a magnet institute by picking the fields that underlie the new waves of technological development and to motivate creative students, researchers and faculty members by supporting with best possible facilities. And to develop competent and competitive science and technology man power with a social conscience. Hence, grade system has been already implemented in our curriculum; industry interaction cell has been constituted; library up-gradation with digital library, learning resource development centre, media centre etc. have been initiated.

The extensive **Training Needs Analysis** (TNA) carried out within the institute speaks out that the necessity of training needs can never be overstressed. The key resource of Government engineering college (THDC-IHET) is competent young and efficient manpower with the right attitude. A conscious policy for the training of human resource would empower the Institute to meet the challenges in the path of development.

The table below is given for funds requirements and assigning in various sub heads to be used for upgradation of technical skills of the faculty and students.

S. No	Activities	Total proposed budget	Financial year		
			2017-18	2018-19	2019-20
1	Infrastructure improvements for teaching, training and learning through:				
	(i) Modernization and strengthening of laboratories	1.75	0.85	0.65	0.25
	(ii) Establishment of new laboratories for existing UG and for new PG programmes	1.22	0.85	0.22	0.15
	(iii) Modernization of classrooms	0.95	0.45	0.35	0.15
	(iv) Updation of Learning Resources & software	0.75	0.45	0.18	0.12

	(v) Procurement of furniture	0.24	0.12	0.08	0.04
	(vi) Establishment / Up gradation of Central and departmental Computer Centers, automation system	0.84	0.51	0.22	0.11
	(vii) Modernization/improvements of supporting departments	0.29	0.16	0.08	0.05
	(viii) Modernization and strengthening of libraries and increasing access to knowledge resources	0.53	0.23	0.15	0.15
	(ix) Refurbishment (Minor Civil Works)	0.61	0.35	0.18	0.08
2	Providing Teaching and Research Assistantships to increase enrolment in existing and new PG programmes in Engineering disciplines	0.62	0.22	0.15	0.25
3	Enhancement of R&D and institutional consultancy activities	0.51	0.21	0.15	0.15
4	Faculty and Staff Development (including faculty qualification upgradation, pedagogical training, and organizing/participation of faculty in workshops, seminars and conferences) for improved competence based on TNA	0.78	0.35	0.22	0.21
5	Enhanced Interaction with Industry	0.44	0.17	0.12	0.15
6	Institutional management capacity enhancement	0.34	0.14	0.12	0.08
7	Implementation of institutional reforms	0.36	0.11	0.17	0.08
8	Academic support for weak students under the aegis of Finishing School to supplement subjective, personality development, communication and employability related value added trainings.	0.425	0.21	0.09	0.125
9	Technical assistance for procurement and academic activities	0.25	0.12	0.08	0.05
10	Incremental Operating Cost	0.985	0.38	0.38	0.225
TOTAL (In crores of Indian Rupees)		11.89	5.88	3.59	2.42

2.2 ACTION PLAN

2.2 (a) Improving the learning out comings of the students.

1. Ascribe Training Needs Analysis. Also, provide Faculty Development Plan to accomplish improved competence based on Training Needs Analysis (TNA) in the following areas:

- Training for Bridging among Basic and Advance education.
- Participation in workshop, seminars, short-term courses etc.

- Faculty qualification enhancement.
- Domain based knowledge augmentation.
- Research capability improvement.
- Industrial training in concerning domain to minimize the academic and industrial gap.
- Training for project handling.

Training identifies its importance towards realizing quality improvement goals and objectives. October 2016, witness the objectives formulation month of quality improvement scheme, which can be implemented for overall improvement of the institute. It is concluded that Faculty development played a vital role when the objective is towards the development of the Institute as a whole. Hence, in the direction of faculty development, training identifies as the remedy. Various modes are formulated that are directly target the product improvement, services and quality products. Faculty development scheme include general (commutation and teaching skill) and technical skills by means of inviting faculty of world class from various universities and industry of the globe and sending faculty and staff for academic interaction around the globe to learn the latest technology and trends.

Details of Training Need Analysis for Faculty

S. No.	Area of training/ development	Number of Faculties	Name of Department	Duration	Trainer organization
1.	Course on intelligent system applications to the smart electric grid	3	EED	One Week	IITs/ NITs/others
2.	Short course on economics and financing of renewable energy technology	4	EED	One Week	NITTTR
3.	Instrumentation and Control	3	EED	One Week	IITs/ NITs/others
4.	Grid Integration with renewable sources	4	EED	One Week	NITTTR
5.	Construction technology and management	3	CED	One Week	NITTTR
6.	Urban Transportation Systems	2	CED	One Week	IITs/ NITs/others
7.	Advanced Material & Manufacturing	2	MED	Two Weeks	IIRS
8.	Micromachining and Micro fabrication	2	MED	One Week	IIT's
9.	Ansys, CFD, Mechatronics	3	MED	One Week	IITs/ NITs/others
10.	E-commerce	3	CSED	One Week	NITTTR
11.	MATLAB programing	3	CSED	One Week	IITs/ NITs/others

12.	Network security, theoretical and practical perspective	3	CSED	One Week	NITTTR
13.	Internet of Things (IOT)	4	CSED	One Week	IITs/ NITs/others
14.	Big data and Security	3	CSED	Two Weeks	IITs/ NITs/others
15.	Cloud Computing/Pervasive Computing	3	CSED	One week	IITs/ NITs/others
16.	Python & web technology	3	CSED	One Week	IITs/ NITs/others
17.	VLSI design	4	ECED	One Week	IITs/ NITs/others
18.	Wireless Sensor Network	3	ECED	One Week	IITs/ NITs/others
19.	Wireless & mobile communication	4	ECED	One Week	IITs/ NITs/others
20.	Pattern recognition & deep learning	4	ECED	One Week	NITTTR
21.	Optical fiber link design	4	ECED	One Week	NITTTR
22.	Mathematical Modeling and Matlab	3	Maths	One Week	IITs/ NITs/others
23.	Laser Science and Technology	1	Physics	Two Weeks	IIRS
24.	Culture and Communication	1	English	One Week	IIT's
25.	Research mythology & quantitative techniques with software applications	2	Any	One Week	IITs/ NITs
26.	Robotic Vision and Image Processing	3	Engg	One Week	NITTTR
27.	STC under QIP on theory and practices	2	TEQIP Coordinator	One Week	IITs/ NITs
28.	Advanced computing in Engineering and science	2	All department	One Week	NITTTR
29.	Inter personal communication Skills	3	All departments	One Week	IITs/ NITs
30	Hands on training in Fab lab	04	ECE	One week	Abroad
31	Hands on Training on Hydro projects	05	CE, ME	One week	THDCIL
32	Hands on training on PLC and SCADA	05	CSE, ECE	One week	Industry

2. Staff training (technical and administrative staff):

Details of Training Need Analysis for Staff

S. No.	Area of training / development	Number of Staff	Name of Department	Duration	Trainer organization
1.	Digital Library Management	1	Library	One week	NITTTR
2.	Repair and maintenance of Computers	3	CSED/ EEED	One Week	IITs/ NITs
3.	Training on Tally, Accounting.	1	Accounts	One Week	NITTTR
4.	Training on Store Management/ Material management	3	Administrative staff	Two Weeks	IITs/ NITs
5.	MS Office, Win-XP, Linux	3	App. Sc.	Two Week	NITTTR
6.	Training on GOs, Office records, Establishments	2	Establishment	Two Week	NITTTR
7.	Physics Laboratory organization and updating	1	App. Sc.	One Week	NITTTR
8.	Internet Collaborative tools for Librarians	1	Library	One Week	IITs/ NITs
9.	Photoshop and Flash	2	CSED	One Week	NITTTR
10.	Manufacturing of Electrical machines	3	EEED	One Week	IITs/ NITs
11.	Maintenance of Fiber optics Lab	3	EEED	One Week	NITTTR
12.	Material testing and heat treatment	2	MED	10days	FTI Bangalore
13.	Multi Skill Development Programme	2	MED	06 Week	FTI Bangalore
14.	Machine Tool maintenance	1	MED	03 Week	FTI Bangalore

3. Increasing capacity of UG, PG and PhD education (increasing enrollment and starting new UG, PG and PhD programmes)

The institute is planning to increase the UG, PG and Ph.D. students in the institute by means of recruiting more faculty members of repute so that they can attract good students and also providing cutting edge technology platform to come at par with world class universities in terms of research outcome.

4. Investing in smart classrooms, campus Wi-Fi, e-library, video conferencing etc.

Institute look forward to include numerous information technology aids for the modernization of technical education. Smart class rooms provide the vision of understanding complex analogies more easily and in more defined and organized way. Institute equipped with 2 Smart class rooms include smart podium, smart board, sound

system (3 cordless+1 collar Mic), 2 touch pad, Laser pointer and stylus, projector, projector screen. Campus is also equipped with 32 Mbps leased line, and campus fully Wi-Fi enabled and plan to upgrade to 100 Mbps (Proposed) so that more and more e-learning and online enabling infrastructure is created. Institute identified several novel journals and E-library and video conferencing is also proposed and is planning to have more and more smart class rooms and smart library with extension to the living places of students and faculty members. With the help of video conferencing the students can take advantages like video lectures, as well as training and placement activities might got the chance to increase.

Smart class room will be procured as per the departmental requirements in the following Departments of the college

- Mechanical Engineering
- Civil Engineering
- Electronics and Comm. Engineering
- Computer Science & Engineering
- Electrical Engineering
- Workshop
- Library

Details of smart classrooms, campus Wi-Fi, e-library etc.

No. of Smart Class Rooms	Smart Classroom Peripherals	Wi-Fi	Video conferencing	E-Library/ E-Journal
03 (Available) 07 (Proposed)	Smart board (01), Sound System, (3 cordless+1 collar Mic.) Touch pad (02) Laser Pointer (01) Stylus (01) Projector (01) Projector Screen (01)	Bridges-: (04-Proposed)+ (02-Available) Access Point-: (10-Available)+ (24-Proposed)	HD Video Conferencing via Internet. (One to One and One to Many) (Proposed)	E-Library (Proposed) E-Journal (Proposed)

5. Action Plan for providing support to SC/ST/OBC students through above mechanism without casting them

Weak students could be from either general or disadvantaged groups. The efforts to help weak students would include all categories of students.

a) Offering extra classes/remedial classes

- ✓ Extended college timings for 1st year students to cope with the syllabus as well as weaknesses identified in Mathematics and Science and given special attention to the new subjects, viz., C Programming Language Skills, Engineering Graphics and

Engineering Mechanics/ Fundamentals of Mechanical Engineering, basic electrical or Electronics Engineering etc.

- ✓ Allotment of extra periods in time table for subjects where the failures would be more.
- ✓ Doubts clearing sessions would also be included in these classes.
- ✓ Subject-wise printed assignments would be supplied to the weak students. Doubts, if any would be cleared by the faculty.
- ✓ Calling experts from institutes of national repute and abroad as has been done currently also. The practical hands on experience will be provided to the weaker students so that they can come at par globally.
- ✓ This would be an inclusive process. Weak students from **SC/ST/OBC** categories would also be included in the remedial classes without labelling them.

b) Continued support to weak students throughout their pursuit of degree

- ✓ Again after the second internal examination weak students will be identified and remedial classes conducted.
- ✓ The entire work of identifying weak students will be done by designated class coordinator. The schedule of remedial classes and the identification of teachers would be done by first year overall coordinator.
- ✓ Peer Groups in each class: Students will be encouraged to form Peer Groups to help some of their fellow students, who are lagging behind in academics. By this grouping, many of the students would feel comfortable in getting clarifications for their doubts and strengthening the concept of the subject to clear their examinations.
- ✓ The weak students will be identified and grouped in each class subject-wise and attached to Student Peer Group Team Leader.
- ✓ Peer group Team leaders will be trained and letters of appreciation will be given for better performing students as well as the peer group team leaders.
- ✓ The HODs and faculty will evaluate and assess improvements in performance of each student on regular basis and continue counselling and taking corrective actions wherever required.

c) Offer special courses for developing soft skills and professional skills among students

- ✓ The institute has a language laboratory and a faculty for English language class will form a part of the curriculum on and beyond first year also and use of language lab made mandatory
- ✓ The institute will, through internal faculty as well as external experts will organize soft skills training throughout the pursuit of degree for students so that students are ready for employment.

d) Conduct intensive training for at least four weeks for those students who graduate but fail to secure employment and conduct special campus interview for placement:

Special efforts based on need assessment of students be made through especially designated faculty as coordinator. If required external agency will be hired to provide training in required skills, including preparation of resume facing interviews etc and though special placement drive, efforts will be made for securing employment trainings will be organized for students.

e) Develop formative assessment tests to (continuously) assess improvements in weak students

- ✓ Develop formative evaluation test (to assess their knowledge enhancement on continuous basis) for each subject separately
- ✓ Conduct these tests at regular intervals (predetermined schedule)
- ✓ Maintain performance record of each student
- ✓ Advice students based on performance on how to improve counseling for motivation.

f) Introduce award/reward system for better performing weak students

- ✓ Identify on the basis of the formative evaluation tests good performing students
- ✓ Reward them with praise, word of appreciation or may be with financial incentive
- ✓ For those showing enhanced performance in the first/ second semesters University examination develop a scheme of reward by the management of the institute

g) Introduce award/reward for Senior students on the basis of performance

- ✓ Identify on the basis of the formative evaluation tests senior students who have been able to improve performance of weak students.
- ✓ Introduce award/reward system to encourage performance of students and tutors

h) Monitor:

The Coordinator will monitor the following:

- ✓ Transition rate of students from first year to second year
- ✓ Transition rate of students from second to third year
- ✓ Transition rate of students from third year to fourth year
- ✓ Student completing degree with minimum to nil back log
- ✓ Improve performance of individual students
- ✓ Increased satisfaction index of students

i) Action Plan for Supporting Weak Students:

- ✓ Develop and conduct standard tests in science, mathematics and English to assess level of competency at entry level
- ✓ Identify tow performing students in various departments from second, third and fourth year based on results
- ✓ Assess reasons for low performance through discussions with students and concerned faculty
- ✓ Decide course contents for special coaching/ remedial efforts
- ✓ Identify institution faculty, academically sound senior/ external support and award them with teaching assistantships for peer to peer assistance
- ✓ Arrange extra special classes based on the assessment of standard tests for weak students
- ✓ Develop formative assessment tests to (continuously) assess improvements
- ✓ Arrange group discussion and brain storming session on each chapter at the week end
- ✓ Arrange industrial visit for getting practical knowledge
- ✓ Introduce award/reward system to encourage performance of students and tutors

6. Instituting academic and non-academic reforms including Programme flexibility (Is there any need to revise the curriculum) when it was last revised.

Academic reforms are monitored in regular interval of time by the Institute as well as the University, but only the University have the power to change academic syllabus. It was revised by University in Year 2015-16.

2.2(b) Action Plan for Improving Employability of Graduates

The institute realizes that to increase employability of our graduates, some of the key issues that emerged from environmental scan and SWOT analysis need to be addressed. These issues are:

(a) Technological Development– is Multidisciplinary where disciplinary boundaries are fading,

(b) Information explosion– availability of too much information due to net and websites and print material, therefore, there is need for intelligent processing to solve specific problem for which our graduate must be prepared,

(c) Globalization– there is felt need for global standards of competence in manpower and products,

(d) Endangered Environment – concern and awareness and knowledge of environmental principles to be adopted while designing / implementing projects, **(e)** Emerging **Social & Responsibilities** of engineering profession,

(f)Participatory Corporate Structures – learning to use delegated authority with accountability, leadership and team work,

(g)Short product lifecycle due to fast changing technology,

(i)Need for first time design success-Modeling and simulation,

(j) Multi-cultural awareness and International Engineering - functioning appropriately in cultural diversity, knowledge of foreign language and Society's increased expectations from educational institutions

The above issues are highlighted when it is realized that our current curricula does not respond to most of them and that there is a wide gap between the capability and the skill level of our fresh engineering graduates and the expectations of the industry in terms of technological knowledge and proficiency of skills. There is a felt need to bridge this gap. Therefore, the institution plans to adopt following strategies:

1. **Offering Industry friendly curriculum and Form strong proactive relationship with industry:**

   Providing additional emphasis on teaching learning and training processes based on revised/new curricula offering programs with flexibility and credit system involving relevant industry and service sector stakeholders. Especial cells namely; Training and Placement Cells will be established to continue the existing efforts and enhance industry linkages for mutual benefit. The heads of these Cells will work actively with HODs and senior faculty to tap relevant industry for training and placement activities. Especial efforts will be made for inviting relevant industry for visiting institution to create awareness about the institutional facilities and facilitate placement of students.

2. **Focus efforts on inviting industry for campus placements:**

   A number of reputed companies in Manufacturing and Construction Sectors visit the College for campus recruitment. The college plans to reconstitute the Training and Placement Cell to make it more effective with the participation of all HODs. However, college recognizes that much needs to be done to ensure better placement of students on increased salary packages. For this more industry institute interaction activities will be initiated in terms of inviting industry experts to judge technical fests annually, visit institutional facilities, seeking at least 2 live industrial problems/ projects/ sponsored research and consultancies for students in each department.

   The institute has come up with concept of incubation of companies and in this regards one company has already come to the campus and has setup its center in the institute to give better opportunity to the students to interact and know their working environment.

2.2 (c) Action plan for increasing faculty productivity and motivation

- ✓ The faculty and staff will be motivated and get affianced in research and development activities and the reputation of institute will improve by collaboration with various research institute and industry.
- ✓ The departmental proposed activities will be sustained after the project period. The research and development foundation built will be utilized to further increase number the projects, publications, products and patents.
- ✓ The faculty will be encouraged by giving incentives for their achievements in the area of research and academics.
- ✓ They will be allowed to go for various levels of interaction with industry and academic institutes of world repute to know the culture and current state of the art work going on in those entities.

1. Instituting incentives and awards to faculty and students for the recognition of their achievements under the following heads:
   (a) Patents
   (b) International Publications
   (c) Product development
   (d) Product marketing
   (e) Consultancy
2. Developing state of the Art, testing & calibration faculties

- **Developing research interest among undergraduate students, and**
  a. Deputing batches of students to maintain equipments with the support of laboratory technical staff.
  b. Teaching with an optimised blending of theory and practice
  c. Promoting and motivation students to take up practical problems and then applying for patenting for newly developed products.
- **Collaborating with Indian and foreign institutions in academic and research area through MoUs**
  a. Publicising expertise with in the Institute to market the Intellectual capabilities of the faculty and students.
  b. Giving incentives and awards on 3 best Industry-Institute Interactions

2.3 Provide an action plan with timelines for

2.3(1). Obtaining autonomous institution status from UGC

- ✓ The institute much focused for obtaining the autonomous status for the institute for modernizes our curriculum or make them locally relevant. Colleges with academic and operative freedom are doing better and have more credibility. The financial support to such colleges boosts the concept of autonomy.
- ✓ To make our institute competitive with global world. Education Commission (1964-66) recommended college autonomy, which, in essence, is the instrument for promoting academic excellence.

- ✓ The institute is planning for institutional autonomy and committed for achieving it. For achieving this we are sending letters to government, proposed meeting with honorable chancellor of Uttarakhand technical university, proposed meet with technical secretary of Uttarakhand and achieving technical holding ability within the institute.
- ✓ State government has been approached in this regards and working towards various steps to be taken in this regards

2.3 (2). Improving the NBA accreditation status

- ✓ Institute has the classes, laboratories, infrastructure, course & faculties are in accordance with NBA Norms. As per the NBA policy minimum two undergraduate batches should be passed out, in this context our first batch will be pass out from our institute in June, 2017, then after we will apply for the NBA accreditation of B.TECH courses. Also we have strategic plan for accreditation as we are having good student faculty ratio, better Teaching facility, good infrastructure and global campus.
- ✓ The Institute is emphasizing on quality teaching & quality education with use of technology (audio-visual aid, projector assisted teaching, NPTEL online video Lecture and many more aids).
- ✓ The Institute is focusing on educational objectives, program outcomes, curriculums, student's performance, faculty contributions, facilities and technical support, academic support units and teaching learning process & continuous improvement in attainment of outcomes.

2.4: Action Plan for BoG strengthening/ ERP/MIS systems:

2.4 (1). Enhanced assistance / monitoring of the institution from its ATU.

- ✓ Working in this area, we are going to sign MOU with different university and pioneer institutions; we will also take help from ATU.
- ✓ We have already done MOU with two universities of abroad and working in line to get MOU done with 2 more universities of world repute who have agreed to mentor in the area of fabrication of various components required in VLSI area and sensors.

2.4 (2). BoG strengthening.

The Institute is developed under MOU with THDC India Lts and ATU and has its BOG in existence. The BOG shall be changed if constituent of the BOG is not as per the guidelines of the UGC/TEQIP III. However, State government has been informed to allow for the changes in the BOG if needed as per guidelines.

2.4 (3). Existence of ERP / MIS system.

Very soon the institute is going to implement the enterprise resource planning software. In this regards we have already purchased the software and one software "splash" is already implemented in library for automation of library system. The Institute is implementing the ERP in phased manner as internal networking of campus with fiber backbone has been completed very recently only.

4. Mechanism of special classes in the institution for improving performance in GATE exam.

The institute is conducting special classes in the evening time for GATE aspirants. The institute has invited several faculties from reputed institutions for special lecture for GATE aspirants. As a result the GATE qualified students have increased in the institute. The GATE qualified students of 2015 were 56, in 2016 increased to 78 and working towards getting 90% result of GATE for the number of students appearing in the 2017. For increasing and improvement in GATE score we will call several reputed professors for enhancing the result.

2.5 Twinning plan with a high performing institute.

For objective of capacity building knowledge transfer and developing long term strategic partnerships we sign an MOU with high performing institute NITs/IITs and foreign universities for faculty and student exchange program for enhancing the quality of education.

2.6 Recruitment and selection of high -quality faculty.

In this Institute the recruitment of faculties is done by Uttarakhand Technical University, Dehradun. So there is no such type of problem for selection of High – quality faculty. The simple procedure is adopted for recruitment as per the government rules.

2.7 Action plan to ensure that the project activities would be sustained after the end of the Project.

- ✓ The facilities and the up-gradation of the existing laboratories will be utilized to fetch the projects sponsored by AICTE, UGC, DST, DBT etc and to generate consultancy fund. The money thus generated will be utilized to carry on existing activities even after end of the TEQIP-III grant.
- ✓ Several R&D activities will lead to core and innovative research with technological advancement that will help the hilly area of India &Uttarakhand to

solve their daily life problems which they face day to day will improve by collaboration with various research institute and industry even after the completion of TEQIP III project.

- ✓ Enhanced R&D activities will result in improving the number of consultancy projects and sponsored research projects. It will increase the revenue generation as well as enhance the reputation of institute even after completion of the project.

2.8. Participation of Departments/faculty in the preparation of the IDP

- ✓ The preparation for participation in the TEQIP III program was initiated by the institution.
- ✓ The biggest motivation the faculty of institute enjoys is that their efforts lead to the upliftment of the institution pays high attention to research, development and innovation.
- ✓ All stakeholders including Director, HODs, Faculty, Staff, Students, and Employers have preparation of Strategic Plan (2017-20)
- ✓ All employees of the institution and all categories of staff have given their inputs to the kind of training they have undergone and they desire to undergo as per TNA.
- ✓ The Director, HODs and faculty have collectively developed the institutional Strategic Plan based on which the IDP has been prepared by the same team of Director, HODs and faculty. Numbers of staff members have also contributed to generating the IDP and bringing it to this shape.

Center of Excellence of Departments:

- ✓ **COMPUTER SCIENCE & ENGINEERING**

Computer Science: Creating Tehri District for Educators:

Computer Science: Creating Tehri district for Educators to design, support, and test the efficacy and sustainability of a Tehri district-based model for scaling and providing sustained support for teacher professional development to teach the new Advanced Placement (AP) Computer Science Principles (CSP) course. CSP focuses on computer science principles, providing students with a foundational understanding of the underlying logic, grammar, thinking and communication skills, and problem-solving approaches of computational thinking. Courses and curricula meeting the AP CSP learning objectives have been piloted at a number of sites but a major obstacle persists: the lack of professional secondary school educators capable of teaching CSP effectively. Using proven curriculum and pedagogy developed through a CS Principles pilot project, CS: Creating a Village for Educators aims to provide a model for building, growing and sustaining a regional community of high school and intermediate CS Principles teachers. It

creates "villages" for educators, with Tehri district- and peer-based supports for introduction of new curricular and pedagogical content. This Tehri district-based "village" model prepares CS Principles Master Teachers within district and develops effective, sustainable supports for new CS Principles teachers.

Systemic educational change requires district-level support to be launched, incrementally scaled, and sustained. If successful, the project will introduce and scale a new AP CS Principles course through numerous major secondary school districts within Tehri District. Equally important, it will create a Institute-connected, district-based training structure for keeping the course (and related computing courses) current as new technologies and global challenges place increasing demands on the workforce skills and knowledge needed by high schools and intermediate students.

Project Goals and Outcomes:

We aim to create "districts as villages" to support broad introduction of Computer Science (CS) Principles in high schools and intermediate Schools. Our research focus is on how to create sustainability in offering of this course, and on how this study may act as a case study for the more general challenge of rapidly updating secondary school curriculum in the face of accelerating skills and knowledge demands of a technology innovation-based economy. This project is designed to test the efficacy and sustainability of a district-based model for the professional development, and ongoing support of teachers for a new Advanced Placement (AP) CS Principles course in secondary schools, both within and across districts.

Objectives:

- ✓ Select and train Master Teachers (MTs) to teach CS Principles within Tehri district.
- ✓ Evaluate the effectiveness of Professional Development for new teachers in district as presented via Master Teachers
- ✓ Define, develop, and evaluate district-based support system elements that may contribute to a sustainability environment or "village."
- ✓ Assess the ongoing role for higher education in the district-based "village" for sustained teacher professional development.

✓ ELECTRICAL ENGINEERING:

Incubation Center for Solar Power System Installation and Maintenance:

As Himalayan range are diverse towards its green and clean environment, hence it is our duty to remain it clean and keep the society aware about new technologies with which it become more tranquil. Institute look forward to establish an incubation center which work with the students to identify new locations to setup solar based off-grid or on-grid power station along with local residents. Moreover, regular

training sessions can be organized in which the students as well as the residents take training of solar power plant installation and maintenance. It is also been projected to setup HOMER based lab that underline the global standard for micro-grid modellings and analysis.

Electrical Workshop:

From past experiences it is identified that after U.G courses the students remain unaware about the practical assembly of electrical motors and generators or appliances. Moreover, in B.TECH courses there is no provision of practically make students understand how a motor/generator windings are practically winded, as it is associated with ITI and Diploma courses. Hence, the department proposed to establish an ELECTRICAL WORKSHOP. In will definitely help students to make themselves comfortable with the industries.

- ✓ **CIVIL ENGINEERING**

To establish Lab's for the purpose of development & research in the field of civil engineering well established Lab's will provide opportuning for developers to conduct testing & experiments which will facilitate the development work in the surrounding region establishment of models of different civil engineering structures will help people to understand & observe civil engineering works and it will provide flew good knowledge & better understanding of the structures they are using in their in their real lives.

- ✓ **MECHANICAL ENGINEERING**

Institute centralize innovation Centre:

Our institute situated in hilly area of Uttarakhand so in the field of mechanical engineering institute has to plan encourage our student for research or innovate new tools and machines who replace old method of farming ,agriculture, transport and save time of villagers.

- ✓ **ELECTRONICS & COMMUNICATION ENGINEERING**

VISION

Create an educational environment to mould the students to meet the challenges of modern Electronics & Communication industry through state of the art technical knowledge and innovative experimental approaches

MISSION

- To create learning, development & testing environment to meet ever challenging needs of the electronic industry.
- To create entrepreneurial environment and industry interaction for mutual benefit, also enrich and train the local villagers and motivate them to establish small scale industries of electronics for their overall growth and create a self

sustained business like toy industry, self made mobile phone chargers, solar based various energy equipment.

- To create laboratory of high standards including anechoic chamber, measurement facilities, testing facilities for various commercial equipment and systems.
- To become a global partner in training human resources of Uttarakhand in the fields of chip design, instrumentation & networking so that trained manpower can help to uplift villages of Uttarakhand in the field of modern India, digital India.
- To establish, modern labs for learning of students so that they can compete with global world.
- To start several electronic projects related to the hilly area problems so that our students & our team jointly can help peoples in solving their problems via electronics.
- To associate with internationally reputed institutions for academic excellence and collaborative research.
- The institute will be in line with reputed institutes of the world at the completion of project. As institute has already established interaction cells with many universities abroad and will work in this line more prominently to be advantageous for getting better opportunities to the stakeholders of the instiutes.