Annex-IV (B).a (ii)

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME
(TEQIP)

PHASEII

FORMAT FOR
INSTITUTIONAL DEVELOPMENT
PROPOSAL
for
Sub-Component 1.1: Strengthening Institutions to improve Learning Outcomes and employability of Graduates
(Revised Plan Up To October 2016)

1. INSTITUTIONAL BASIC INFORMATION

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1.1 Institutional Identity

- Name of the Institution: WEST BENGAL UNIVERSITY OF TECHNOLOGY (Maulana Abul Kalam Azad University of Technology, West Bengal; [Vide Gezette notification: Monday April 6, 2015)
- Is the institution AICTE approved? : Yes
- Furnish AICTE approval No : AICTE/E&T/ENGG/APPROVED/2009-10
- Name of the affiliating University: WEST BENGAL UNIVERSITY OF TECHNOLOGY (Maulana Abul Kalam Azad University of Technology, West Bengal; [Vide Gezette notification: Monday April 6, 2015)
- Type of Institution : Govt. aided
- Status of Institution: Autonomous University
- Name of Head of the institution : **PROF. RANJAN BHATTACHARYAY,** Vice-Chancellor (Full time appointee)

- Name of Head of Institution and Project Nodal Officers

Head and Nodal Officer	Name	Phone Number	Mobile Number	Fax Number	E-mail Address
Head of the Institution (Full time appointee)	Prof. Ranjan Bhattacharyay	033 23217578	+91 9339162505	033 22002444	vc@wbut.ac.in
TEQIP Coordinator	Prof. Sudakshina Kundu	033 23210731 Ext - 115	+919433260903	Nil	skundu_fin@yahoo.co.in; sudakshina.kundu@wbut.ac.in
Project Nodal Officers for:					
Academic Activities	Dr. Jaya Bandyopadhyay	033 23210731 Ext - 125	+91 9836665794	Nil	Jaya.bandyopadhyay@gmail.com
Civil Works including Environment Management	Mr. Uttam Khan (Contractual Engineer)	033 23210731 Ext - 105	+91 943263912	Nil	uttamkhan@hotmail.com
Procurement	Dr. Shaon Raychoudhury	033 23210731 Ext - 108	+91 9831034235	Nil	shaon.raychaudhuri@gmail.com
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Equity Assurance Plan Implementation	Dr.Debashis De	03323216828	+91 9830363215	Nil	dr.debashis.de@gmail.com

1.2 Academic Information:

- **Engineering UG and PG Programmes offered in Academic year 2009-10**

Sl. No	Title of Programme	Level (UG, PG, PhD)	Duration (Years)	Year of starting	AICTE Sanctioned Annual intake	Total Student Strength
1	B.Tech (IT)	UG	4	2004	30	120
2.	B.Tech (CSE)	UG	4	2007	30	120
3.	MTECH (BIO-TECH)	PG	2	2003	18	23
4.	MTECH (BIO-INFORMATICS)	PG	2	2005	18	17
5.	MTECH (IT)	PG	2	2005	18	36
6.	MTECH (SE)	PG	2	2005	18	36
7.	ME (CSE)	PG	2	2005	18	36
8.	MTECH (Industrial Engg. & Mgmnt)	PG	2	2008	18	25
9.	MTECH (MVD)	PG	2	2007	18	30

• Accreditation Status of UG Programmes:

Title of UG Programmes being offered	Whether eligible for accreditation or not	Whether accredited as on 31st March, 2015	Whether "Applied for" as on 31st March, 2010 **
B.Tech (IT)*	Yes	No	Registered
B.Tech (CSE)	Yes	No	Registered

- The B.Tech (IT) course was transferred from IIIT-C, Kolkata to West Bengal University of Technology in 2003-04, and the AICTE approval was obtained in 2005.
- The University has registered for NBA Accreditation for B.Tech. (CSE) in 2013. [ID: 561-06.11.2013]
- Application for Accreditation of B.Tech. (IT) has been made in August 2010. [ID: 1229-30.08.2013] Inspection has not been done. Hence on-line re-registration has been done.

• Accreditation Status of PG Programmes:

Title of PG Programmes being offered	Whether eligible for accreditation or not	Whether accredited as on 31st March, 2015	Whether "Applied for" as on 31st March, 2015
M.TECH (BIO-TECH)	Yes	No	Registered
M.TECH (BIO-INFO)	Yes	No	No
M.TECH (IT)	Yes	No	Registered
M.TECH (SE)	Yes	No	No
ME (CSE)	Yes	No	Registered
M.TECH (Industrial Engg.& Mgt)	Yes	No	No
MTECH(MVD)	Yes	No	No

- **The University has re-registered for NBA accreditation for the B.Tech (IT) and M.Tech (Bio-Tech, IT, CSE)**
  [Application for NBA Accreditation has been done in August 2013. No inspection has been done. Online re-registration has been done. Original Application ID: 1229-30.08.2010 has been retained]

1.3 Faculty Status (Regular/On-Contract Faculty as on March 31, 2015)

Faculty Rank	No. of Sanctioned Regular Post	Present Status : Number in Position by Highest Qualification												Total Number of regular faculty in Positions	Total Number of Vacancies	Total Number of contract faculty in Position
		Doctoral Degree				Masters Degree				Bachelor Degree						
		Engineering. Disciplines		Other Disciplines		Engineering Disciplines		Other Disciplines		Engineering. Disciplines		Other Disciplines				
		R	C	R	C	R	C	R	C	R	C	R	C			
Prof	7	1	0	0	2	NA	NA	NA	NA	NA	NA	NA	NA	1+2	6	2
Asso Prof	19	4	0	1	0	NA	NA	NA	NA	NA	NA	NA	NA	5	14	0
Asst Prof	23	5	0	0	0	5	NA	NA	NA	NA	NA	NA	NA	11	12	0
Total	49+1*	10	0	1	2	5	NA	NA	NA	NA	NA	NA	NA	16 + 2	34	2

Prof = Professor, Asso Prof = Associate Professor, Asst Prof = Assistant Professor, Lec = Lecturer, R = Regular, C = Contract Copies attached **(Annexure – I)**

*** There are 49 sanctioned posts plus one contractual Associate Professor has been regularised following a litigation.**

1.4 Baseline Data (all data given for the following parameters must be restricted to engineering disciplines/fields only)

S. No	Parameters	
1	Total strength of students in all programmes and all years of study in the year 2013-14	UG – 180 + PG 205 = Total 385
2	Total women students in all programmes and all years of study in the year 2013-14	Total 97
3	Total SC students in all programmes and all years of study in the year 2013-14	Total 47
4	Total ST students in all programmes and all years of study in the year 2013-14	Total 9
5	Total OBC students in all programmes and all years of study in the year 2013-14	Total OBC
6	Number of fully functional P-4 and above level computers available for students in the year 2013-14 **325**	
7	Total number of text books and reference books available in library for UG and PG students in the year 2013-14	E-books – 343, Journals – 56, e-journal – 10064 course-specific software – 400, Book titles – 19195, Books (Volumes) = 30154
8	% of UG students placed through campus interviews in the year 2013-14	50 %
9	% of PG students placed through campus interviews in the year 2013-14	14.15 %
10	% of high quality undergraduates (>75% marks) passed out in the year 2013-14	16.66 %
11	% of high quality postgraduates (>75% marks) passed out in the year 2013-14	43 .39 %
12	Number of research publications in Indian refereed journals in the year 2013-14	7
13	Number of research publications in International refereed journals in the year 2013-14	29
14	Number of patents obtained in the year 2013-14	0
15	Number of patents filed in the year 2013-14	3
16	Number of sponsored research projects completed in the year 2013-14	---
17	The transition rate of students in percentage from 1st year to 2nd year in the year 2013-14 for : (i) all students (ii) SC (iii) ST (iv) OBC	**I) UG+PG = 95.24 %** **ii) 100 %** **iii) 75 %** **iv) 100 %**
18	IRG from students' fee and other charges in the year 2013-14 (Rs. In lakh)	Rs. 1,48. 749
19	IRG from externally funded R&D projects, consultancies in the year 2013-14 (Rs. in lakh)	Rs. 2, 27. 08829
20	Total IRG in the year 2013-14 (Rs. in lakh)	Rs. 6, 86. 65523
21	Total annual recurring expenditure of the applicant entity in the year 2013-14 (Rs. in lakh)	---

2.1 Give the executive summary of IDP:

The Institutional Development Proposal (IDP), framed by the West Bengal University of Technology, is a strategic action document and the plan on academic reforms which are based on the SWOT analysis undertaken as part of the documentation of TEQIP IDP. Strength, Weakness, Opportunities and Threats have been analysed in the context of strengthening the University to improve learning outcomes and employability of graduates.

Analyses show that major "**Strength"** of the University lies in the **right blend of young and experienced faculty** engaged in **quality research in cutting edge technologies**. It also includes having a **40 acre campus,** being readied, at Haringhata, Kalyani that will help the university to expand. The **presence of a number of premier academic institutions has elevated the academic ambiance of the campus surrounding**. Another strength that gets diffused across the affiliated colleges as investment in common facilities such as the University library and the central computing facility creates multiplier effect as these facilities are used also by the teachers and students of a large number of affiliated colleges besides their counterparts at the University.

The **"Weakness",** however, is primarily in the **areas of collaboration with industry** and other national /international institutes, **shortage of faculty, technical and support staff**.

The **"Opportunities"** analysed are its **advantageous location** with reference to industry and premiere institutes, **ever-increasing number of prospective students**, and **growth of R&D industry** in the areas of IT and Biotechnology.

The **"Threats"** are the **rapid obsolescence** of technology, declining quality of students, private affiliated colleges of the University offering similar courses, and establishment of foreign and private universities.

A strategic plan, presented in the following section, has been formulated based on the above analyses. The key activities proposed in the IDP are linked with the results of SWOT analysis and focuses on issues like, **modernization of laboratories**, **augmenting the library**, **creation of new teaching positions** and equipping the entire **faculty team** by **imparting training** on the '**domain knowledge**' as well as on '**teaching pedagogy**'. Such academic reform programme will not be limited to this teaching-learning process but will be extended also to the officers and other technical and non-technical staff. In all cases such interventions have been planned based on a structured 'Training Need Analyses'(TNA). As a part of strategic action, **additional faculty and professional resources will be inducted to supplement the knowledge inputs provided by the core faculty members**. It is expected that this knowledge work force will also elevate their skills by undertaking consulting projects that will be translated through their lectures / interactions. All these strategic initiatives to improve the student quality will directly enhance their employability. Institutional strengthening has been planned to be realized through these aforementioned measures which will further be supplemented through creation of better research facilities.

A budget has been formulated covering the requirements and costs for undertaking the planned activities and includes items like **procurement of equipment** and **software for modernization of laboratories**, **upgradation of library**, **civil work for necessary, refurbishing** and **cost of training** and is presented here-in-under.

2.2 Provide details of SWOT analysis carried out (in terms of methodology used, analysis and information and data as collected and inferences derived with respect to strengths, weaknesses, opportunities and threats.

Methodology and Information collection for SWOT analysis:

A committee was formed in 2010 by the Honorable Vice-Chancellor of the University to conduct and carry out the brainstorming required for the SWOT analysis. The committee members carried out the SWOT analysis in their respective departments and a draft SWOT analysis was prepared. This brainstorming session was carried out involving the major stakeholders of the University, viz. the faculty members, officers, non-teaching staff and students of the University. This brainstorming session at the apex level was presided over by the Vice-Chancellor. The SWOT analysis was finalized following detailed discussions, exchange of views and inputs from the various stakeholders.

Inferences derived / SWOT Analysis

Strengths -

1. High quality faculty members with majority having Ph.D. and others pursuing doctoral research. **The number of faculties with Ph.D.s has increased from 67.7% of the faculties in 2010 to 72.2% in 2014.**

2. Collaboration with industries leading to internships for students is continuing which has scope for enhanced employability. **Over the past four years students have undergone internship in Infosys and Ixia**.

3. Largest engineering university in the state having over 200 colleges affiliated to it of which about 90 colleges offer Engineering courses. This has resulted in possible networking and diverse academic programs churning out the largest chunk of engineering work force for the state/nation. **A Curriculum Development Cell has been formed for revision of curriculum in collaboration with industries.**

4. Networking with premier research institutes and universities such as SINP, ISI, TIFR, IISC, IISER, IUC-DAE, IICB, IIT-Bomabay, Institute of Molecular Science-Okajaki-Japan, AIIMS, PGI-Chandigarh, Institute of genomics and integrative Biology, JNCSAR,BARC, University of Calcutta, Bengal Engineering and Science University, Jadavpur University, University of Humboldt-Germany, EPRC-Bangladesh, University of Western Australia-Perth, St. Petersburg Polythechnic University-Russia, Technical University of Munich, University of New Castle-UK, University of Illinois-Chicakgo, Gwangju Institute of Sc & Technology-Hanyang University. MOU with and Intellectual Ventures Invention Network for research / knowledge sharing culminating in patents.

5. Large number of publications (100 in journals and 110 in conferences over last 5 years) in international peer reviewed journals, and funding from different national agencies like DST, DBT, CSIR, UGC, AICTE etc (Annexure - II).

6. Industry representatives in the participative bodies like Governing Council, Executive Council and Academic Council (Annexure - III) for demand driven curriculum development.

7. Incubation centre approved by DST to facilitate start-up companies and entrepreneurship.

8. Interdisciplinary learning environment is encouraged for the undergraduate students which is aimed at solving industry-oriented problems.

9. A 40 acre campus, being readied, at Haringhata, Kalyani will help the university to expand in terms of student strengths in departments as well as creation of new departments and facilities. The academic ambiance at the location is noteworthy, as premier institutes are existing close by, namely IISER, Kolkata, Dhirubhai Ambani Institute of Information and Communication Technology, BCKV, Kalyani University along with the upcoming campus of West Bengal Univesity of Technology.

Weaknesses -1. Inadequate Internal Revenue Generation.

2. Originally the central computing facility of the University was in need of upgradation. **[This has been upgraded]**

3. Very few University funded Research Fellowships were available. **[TEQIP funded Research Assistants have been a great help.]**

4. Lack of specialized research laboratory. **[Wireless Laboratory for CSE & IT, Green House for Bio-Technology and Advanced Computing facility with MatLab for the entire University has been developed with TEQIP fund.]**

5. Difficulty of retaining quality faculty members due to insufficient incentives. [**This problem has accentuated. Till date five faculty members have resigned, while two have retired.**]

6. Inadequate number of technical & non-technical support staff with requisite skill sets. [**This problem has accentuated.]**

7. Industry-institute interaction was inadequate. **[Interaction through industry in collaboration with the State Project Facilitation Unit (SPFU) as well as the Curriculum Development Cell of WBUT and the Industry Institute Interaction Cell has started.]**

8. Lack of attention for weak students and inadequate number of student publications. **[Diagnostic Test for weak students, remedial and tutorial classes have been started. Publication has got a booste with appointment of Research Assistants and establishment of advanced laboratories.]**

9. Percentage of women students less than the standard percentage. **[Women PG students are given Teaching Assistantships as incentive]**

10. Class rooms not equipped with high quality teaching aids. [**Class-rooms have been developed with teaching aids which are getting used exhaustively.]**

11. Lack of co-curricular facilities for students**. [Students are encouraged to organise Tech-fest and Tech-clubs.]**

Opportunity

1. Growth of large number of R & D industries in the areas of information technology, telecommunications and biotechnology opening up excellent placement opportunities for graduates of this University

2. Locational advantage of the present campus, in close proximity to reputed universities, research institutes as well as industrial units offering the possibility of better industry-academia interaction

3. Ever increasing aspirants in this region providing a steady supply of quality students to take research activities forward in the areas of information technology, biotechnology and other emerging areas

4. Present salary structure of University faculty combined with scope for research in niche areas to attract bright people towards academics and research

Threats -

1. Opening of foreign and private universities with outstanding infrastructure putting the University in a highly competitive environment.

2. Affiliated colleges offering similar courses could lure away students with modern facilities and scope for better career prospect.

3. Rapid obsolescence of technology due to frequent changes in the needs of the industry

4. Adverse impact on employability due to global recession

5. Decline in the quality of students over the years makes teaching-learning process more difficult.

Summary of the SWOT analysis shows that the Strength of the University is the high degree of employability of the graduates and the right blend of young and experienced faculty engaged in quality research in cutting edge technologies. The Weakness includes collaboration with industry and other national /international institutes still at a nascent stage, shortage of fund, shortage of adequately trained technical staff, inadequate number of support staff, absence of specialized laboratories, and poor maintenance of laboratories and instruments. The Opportunities include advantageous location with reference to industry and premiere institutes, ever-increasing number of prospective students, and growth of R&D industry in the areas of IT and Biotechnology. The Threats are the rapid obsolesce of technology, declining quality of students, private affiliated colleges of the University offering similar courses, and establishment of foreign and private universities.

1. Based on SWOT analysis, provide the "strategic plan" developed for institutional development:

It has been decided that to tackle the reform and upgradation activities, a multi-pronged approach will be adopted which will focus on both the hardware and software of the system, i.e. the **improvement of the infrastructure** and **augmentation and upgradation of the faculty base**. The infrastructural improvement will specifically deal with modernization of the existing laboratories and creation of new ones and improvement in the knowledge resources at the library. To this end emphasis on **electronic-journals** has been planned. Such modernization will help the students to grasp the subject both from the practical as well as the theoretical perspective. **Increase in the faculty strength** as well as **their academic development** through various programs would create better and upgraded academic work force. This faculty team will have greater impact on the academic performance of the students leading to excellence. As a part of strategic action, **additional faculty and professional resources** will be inducted to supplement the knowledge inputs provided by the core faculty members. **Faculty development programs** will be organized for the pedagogical as well as state-of-the-art knowledge updation. It is expected that this knowledge work force will also elevate their skills by undertaking consulting projects that will be translated through their lectures/interactions. All these strategic initiatives to improve the student quality will directly enhance their employability. Institutional strengthening will be significantly realized through these afore-mentioned measure which will further be supplemented through creation of better research facilities and research ambiance.

- **How the key activities proposed in the Institutional Development Proposal are linked with the results of SWOT analysis**

The IDP has been developed focusing on three factors – learning outcomes and employability of the graduates as well as institutional strengthening. For this, opportunities have been critically reviewed to align the growth plan both in terms of infrastructure and human resources. Contingency programs are integrated in the plans keeping the threat in view. Emphasis has been made to exploit the strengths that the university has. It has been attempted to not extend the activities in the areas where the weaknesses exist; however, in some areas it has been decided to work on the weakness to overcome the same and convert it to strength.

2.3 State the specific objectives and expected results of your proposal in terms of "Institutional strengthening and Improvements in employability and learning outcomes of graduates". These objectives and results should be linked to the SWOT analysis

To upgrade the infrastructure and consolidate the faculty strength through recruitment in order to facilitate the teaching-learning and research activities so that the learning of the students improves thereby enhancing their employability.

Modernization of laboratories to improve the practical training of the students. To upgrade the library for better access of knowledge resources.

Additional faculty strength to conduct tutorial classes and thus augment the rigour in the learning process to be reflected in improved academic performance. To adopt modern pedagogical methods in both UG and PG teaching by using expertise of faculty members exposed to faculty development programs.

To manage the expectations of industry based on the need expressed by the recruiters such as aligning the syllabi with the current technological scopes and the necessary inter-personal skills.

Imparting knowledge on recent practices to the students by the industry professionals which will improve both their knowledge and employability. The same strategy is to be followed with the faculty members from premier institutions.

2.4 a) **Improving employability of graduates**

- Updation of syllabus: Action plan

  i) *New electives would be introduced, as and when necessary, on the basis of industrial need and emerging fields. Major changes in the curricula will be made every four years.*
  ii) Constitution of Board of studies with 20% members from the industry.
  Iii) Constitute the Curriculum Development Cell to collaborate with industries for up-gradation of syllabus.

- Strengthening of industry-institute partnership activities: Action plan

  i) Setting up the industry institute partnership cell with an earmarked faculty as in charge.
  ii) Organizing short courses (15 – 20 days) for training of engineers and industry personnel every six months as a part of Continuing Education Programme.
  iii) Arranging summer training for pre-final year students in reputed industry house.

- To improve communication skills and general aptitude of the students: Action plan
  (i) *Setting up a finishing school for grooming up of the students.*
  (ii) To initiate programs in soft skill developments and life long learning attitude
  (iii) Making arrangement of respective mock tests to sharpen the technical and general aptitude of the students

- To improve the knowledge base of the students to make them technically adept: Action plan
  (i) Inviting/engaging industry professionals to lecture on certain topics of current interest and latest technological developments
  (ii) Enabling students to obtain internship, participation in industry oriented projects and make the students industry ready

- Strengthening the capability of handling real-world problems and facilitating for higher education: Action plan
  (i) Arrangement of specific lectures covering the syllabus of GATE, GRE etc. for higher studies

  (ii) Facilitating interdisciplinary projects for the undergraduate students aimed at solving industry-oriented problems.

- Introduction of co-curricular activities to augment the knowledge base and sharpen the social skills of the students: Action plan

  Student clubs will be introduced which will carry out tasks in order to fulfill the requirements related to this.

2.4 b) **Increased learning outcomes of the students**

To develop graduates with strong analytical skills and practical ingenuity by inculcating interdisciplinary dispositions: Action plan

(i) Capability enhancement of the undergraduate students for solving problems of interdisciplinary nature by creating a trans-disciplinary learning environment: a*llocating and organizing B.Tech. projects across departments.*

To recruit faculty members and thus ensure satisfactory teacher student ratio as well as the standard: Action plan

(i) Vacant posts to be filled up at the earliest, mentioning doctoral degree as the desirable qualification in the recruitment notices even at the entry level.

To promote creative and entrepreneurial orientation amongst students: Action plan

(i) Holding seminars periodically on innovation and on attributes of professionalism.

Improve the knowledge base and analytical skill of the students: Action plan

(i) Creating a repository of learning resources, arranging remedial teaching and using modern teaching aids

(ii) Engaging senior faculty members from few premier institutes to share subjects with the existing faculty members of the university.

2.4c) **Obtaining autonomous status**

The University is already autonomous.

2.4 d) **Achieving the target of accreditation of 60% of the eligible programs within 2 years and 100% of the programs by the end of the project**

The university runs two undergraduate (B.Tech.) programmes and seven post-graduate (M.Tech.) programmes. At the end of 2013-14 5 courses have registered for accreditation by NBA. The SAR are being prepaed.

Action Plan

Application for NBA accreditation has already been submitted for five courses. Preparation for application for the other four courses will be processed after one and a half years In order to achieve accreditation, the following concurrent actions will be undertaken :

(i) Recruitment of faculty members to maintain the desirable teacher student ratio wherever it is deficient.

(ii) Recruitment of technical staff and also non technical staff with priorities for the programs which will be accreditated after two years.

(iii) Setting up of laboratories in requisite areas and procurement of necessary equipment.

2.4 e) **Implementation of academic and non academic reforms**

Academic reforms

As a part of the reform process, updation of syllabi has been undertaken in the university over the last couple of years and will be continued in the same fashion so that the students can learn the subjects that industry is looking for.

The undergraduate projects in Engineering disciplines will also be offered jointly by the departments with an interdisciplinary perspective. Similarly, some choices of papers as open electives will also be offered to enhance the interdisciplinary perspective as well as to induce flexibility.

Laboratory courses will be reoriented to make the experimental work more purpose driven.

The teaching learning process will be revamped to inculcate in the students skills like problem solving and logical reasoning, process orientation and programming fundamentals. Besides this, emphasis will be given on soft skills like communication, inter-personal relationship & teamwork and leadership.

In order to infuse the industry orientation, industry professionals will be invited to discuss real life case studies and demonstrate the practical perspective.

Students will be encouraged to promote 'TechClub' activities and organize technical quiz/ debate/ model development competitions to gear up co-curricular activities.

Training will be imparted to faculty members on subject domains as well as on pedagogy to bring in a fresh perspective to the teaching-learning process.

Technical staff involved with laboratory/EDUSAT Studio etc. will also be trained up to man the modernized laboratories and the EDUSAT Studio.

Nonacademic reforms

In order to make the system most responsive everyone involved will undergo training programs as part of reform including the entire non-teaching staff.

The university agrees to the delegation of decision making powers to senior functionaries with accountability for smooth functioning.

The university has decided to set up corpus fund, faculty development fund, equipment replacement fund and maintainance fund for sustaining the overall growth in learning outcome of students after the project life.

2.4 f) **Improving interaction with industry**

The following actions have been planned to realize the benefits of exchange for academic development through industry interactions.

(i) The Board of Studies of each department of the university to include industry professionals particularly to help in updating the syllabi within the industry need.

(ii) Inviting industry professionals for delivering talks and interactions with the students

(iii) Faculty members to undertake continuing education programs with industry

(iv) To setup industry institute partnership cell.

(iv) Conducting workshops/short-term courses for industry executive and engineers

2.4 g) **Enhancement of research and consultancy activities**

The plan for enhancing research and consulting activities for institutional strengthening and to ensure a two-way interaction with industry will be realized as presented here-in-under:

(i) Modernization of existing infrastructure including laboratories.

(ii) To engage at least one research fellow funded by the university, in each department.

(iii) Enhancement of e-journal facilities in the library

(iv) Promote the usage of start-up grant to encourage faculty members to initiate research

(v) Regular interaction with industry for procurement of sponsored projects.

(vi) Providing financial assistance to faculty members to enable them to present research papers in national/international conference/seminar/symposium and also to attend workshops.

2.5 Provide an action plan for organizing a finishing school and for improving the academic performance of SC/ST/OBC/ academically weak students through innovative methods, such as remedial teaching and skill development classes for increasing the transition rate and pass rate with the objective of improving their employability.

The approach would be meant for improvement in terms of a) **Curriculum** as well as b) **Employability**

a) **Curriculum**

Goal	Approach	Outcome
• Improve the student's quality in terms of the subject knowledge.	• Appointment of mentors. • The subjects that need special attention in case of individual students would be assessed by the mentor. • Faculty Mentor meeting at the end of the semester to access the student performance. The TNA would be done for the entire batch. • Extra tutorial classes for weak students. • Head of the Department would procure a report from the COE on the overall performance of the students; place it in the faculty meeting to select the subjects to be taught to the incoming batch. • The EDUSAT facility would be used to conduct tutorial classes for both in-house and outhouse students. • A company called EVRON has greatly remodeled our studio and has already initiated tutorial classes using the EDUSAT facility. They plan to open 5 to 6 centers throughout the state.	• Irrespective of the availability of trained faculty in each subject at the different affiliating institutes, common classes would be organized with trained eminent faculty members delivering the lectures.

b) **Employability:**
This concerns the finishing school. This in turn would have two components namely for employability in academia and in Industry. The requirement for the later would also hold true for the former.

Goal	Approach	Outcome
Training for NET/GATE	Through EDUSAT coaching would be provided to students three days a week from 5 to PM.	The total students qualifying NET/GATE is expected to rise significantly.
PERSONALITY DEVELOPMENT		
Improve the language skill	The language laboratory and phonetic classes would be used for the purpose	Improved pronunciation and ability to pickup correct diction.
Communicating within a group and summarizing (GD)	GD would build leadership quality and also the ability of working in a team. Some may have leadership quality but they are more prone to give orders. But in a big organization you need to also listen to others and finally summarize. Thus Group Discussion would be conducted routinely for the students.	The students would be trained to face interview as well as the professional world through inculcation of leadership quality.

Ability to develop a power point presentation	Training in computer applications would be imparted once a week for 2hours.	It is not only important to know the subject or have a bright idea but it is equally important to express it in an impressive manner. Power point presentation is a tool that has immense potential for this purpose. Students would be trained to express themselves properly.
Etiquette to be followed in an interview	Training programs would be conducted by experts from the field of management for the students in the pre-final year.	The students would be industry ready.
DEVELOPMENT OF ANALYTICAL ABILITY		
Ability to think out of the box- lateral thinking	Industry personals as well as trained faculty members would be involved in the process to training students to pick up problems, get a clear understanding of the background of the work and address the problem in an innovative manner. Post demonstration of the skill, the students would be given broad areas which they would investigate to approach new problems and workout their solutions. This attempt has already been initiated with members from Intellectual Venture Invention Network.	Students would develop the ability of lateral thinking and would be innovative. **(Lateral thinking means ability to apply a solution which is obtainable from a different problem. Most often we are constrained in our thinking because we assume certain boundary condition whenever we are trying to solve a problem. That is mostly useful when solving similar problem. However certain problems would not be solvable through this process. Here the ability to think beyond the boundary condition may be the only way out.)**
Engaging in problem solving session	This is a drill which is essential. Working on Soduku and crossword puzzle it develops the skill. Session of 2 hours in the weekend would be introduced for the purpose	Students would develop the analytical ability.
How to write a report/Executive summary	Performing a work and proper documentation of it go hand in hand. This skill is often needs to be incorporated in majority of the individuals while needs to be refined in the rest. It is extremely important to be able to reflect the essence of the work/ innovative idea to ensure its acceptability. Week end classes would be initiated for pre-final year students.	The students would develop the expression skill important for proper documentation of the ideas.

2.7. Training needs analysis for the Faculty Members

While analyzing the current strengths and weaknesses for the SWOT analysis, we observed that the strength of our research and teaching efforts can be improved by increasing the interaction of our faculty with the scientists and technologists of the leading institutes of the world, as we aim to become the leading technological university in this part of the globe.

Thus, we had requested our faculty to identify the areas in which they would require further improvement of their knowledge and skills, and to identify the best source of receiving such training - institutes of national and international repute. This was consolidated at the departmental level, to ensure that the proposed training programs were in conformity with the stated goals of the department. The TNA for individual departments were then discussed in the core committee and the final consolidated list is included below.

We believe that in order to improve teaching skills, it is necessary for the faculty to receive pedagogical training at regular intervals. Since it is not possible to leave the institute regularly for any faculty, we are planning to arrange in-house pedagogical training for all our faculty by reputed experts.

The quality and the level of interest of the technical and support staff are very much important for the smooth operation of laboratories and libraries. We have decided to l provide extensive training for improving communication skills and technical knowledge for our non teaching staff members. This will also include special training for accounts staff so that they are conversant with the use of computers as well modern software required for accountancy.

Basic and advanced pedagogy training

Basic and advanced training on pedagogy will be imparted on all faculty, depending on the needs of the departments and level of experience of the faculty members. The faculty list is provided in Annexure B.

Subject /domain knowledge enhancement
Improvement in Faculty Qualifications

The faculty members without a doctoral degreee shall be provided necessary support and seed money of Rs. 25,000/- each for starting their research work.

Improving Research Capabilities

The faculty of the university are_engaged in continuous interaction with the scientists of different research institutes. However, no lans of Post-doctoral studies is available at the moment.

2.8 18 Month Action Plan for training technical and other staff in their respective functional areas

The BOG strongly felt the need of motivating the technical and non-technical staff of the university for overall improvement in teaching-learning environment. As the specialized instruments procured under the current scheme will be handled by our technical staff members, it is necessary that they be provided with adequate technical training. Furthermore, it is necessary that staff members are able to align their efforts with the age of information technology, and are able to utilize the modern tools of teaching such as the computer and the internet. With these objectives, following plans are made for their all-round development. Proper incentive will be provided for those staff members who have upgraded their qualifications.

Sl. No.	Department/Section	Name of suitable staff member for training/development	Duration (days)	Tentative date of training/development programme	Trainer organization
1	BioTech	Bubai Paul	7 days	Between July 2015-June 2016	In-house
2	CSE	Subhashis Sen Gupta	30 days	Between July 2015-June 2016	IIT
3	School of Mgmt & Sciences	Asim K Gangopadhyay	15 days	Between July 2015-June 2016	In-house
4	COE	E.N.Rao	21days	Between July 2015-June 2016	In-house
5	COE	K.Munshi	21 days	Between July 2015-June 2016	In-house
6	COE	S Chakraborty	21 days	Between July 2015-June 2016	
7	COE	K Ghosh	21 days	Between July 2015-June 2016	
8	COE	S.Ghosh	21 days	Between July 2015-June 2016	
9	COE	R.Mondal	21 days	Between July 2015-June 2016	
10	COE	J.Das	21 days	Between July 2015-June 2016	
11	COE	S.R. Basu	21 days	Between July 2015-June 2016	
12	COE	A Bhattacharya	21 days	Between July 2015-June 2016	

13	COE	S.Adhikary	21 days	Between July 2015-June 2016	
14	COE	A.Paul	21 days	Between July 2015-June 2016	
15	Finance	A.Bhowmik	21 days	Between July 2015-June 2016	Commnwealth of learning
16	Finance	A.Bhowmik	15 days	Between July 2015-June 2016	IIEP
18	Finance	A.Bhowmik	7 days	Between July 2015-June 2016	To be decided
19	Finance	A Prasad	15 days	Between July 2015-June 2016	IIM
20	Finance	S Ghosh	30 days	Between July 2015-June 2016	IIM
21	Finance	A. Sarkar	30 days	Between July 2015-June 2016	In-house
22	Finance	S K Das	30 days	Between July 2015-June 2016	In-house
23	Finance	A K Nandi	30 days	Between July 2015-June 2016	In-house
24	Library	S. Ghosh	30 days	Between July 2015-June 2016	In-house
25	Library	P Ghosh	30 days	Between July 2015-June 2016	In-house
26	Library	N. Biswas	15 days	Between July 2015-June 2016	In-house
27	Library	S Hazra	15 days	Between July 2015-June 2016	In-house
28	Library	R N Polley	15 days	Between July 2015-June 2016	In-house
29	Registrar	Dr. S R Islam (Registrr)	15 days	Between July 2015-June 2016	ATI, NITTR
30	Registrar	R N Bhattacharjee	15 days	Between July 2015-June 2016	In-house
31	Registrar	Dr. G Ghosh	15 days	Between July 2015-June 2016	ATI
32	Registrar	D. Dutta	15 days	Between July 2015-June 2016	In-house
33	Registrar	P Paswan	30 days	Between July 2015-June 2016	In-house
34	Registrar	C Roychoudhury	30 days	Between July 2015-June 2016	In-house
35	Development & Plng.	P Kar	30 days	Between July 2015-June 2016	In-house
36.	Industrial Engg & Mgmt.	Mithun Ghosh	180 days	Between July 2015-June 2016	Globsyn
37	Registrar	Md. Aftabuddin (Info. Scientist)	180 days	Between July 2015-June 2016	CISCO
38	Registrar	Md. Aftabuddin (Info. Scientist)	180 days	Between July 2015-June 2016	Redhat

2.9 Relevance And Coherence Of Institutional Development Proposal With State's Industrial / Economic Development Plan

Vision of Higher Technical Education of West Bengal

"To generate and disseminate Engineering knowledge and skill of the highest quality comparable to the international standard ensuring equity in educational opportunities with thrust for reformation on system of education through execution of a coherent, forward looking and inclusive growth plan emphasizing Post Graduate education and interdisciplinary research initiatives for generation of high quality engineers to become a major supplier of engineering services in the global market and also to
provide innovative technological solutions meeting the aspiration's of the society in conformity with the Traditions, Culture and Heritage of the State".

It is observed that the vision of the State broadly addresses the following key policy objectives :

- Dissemination of highest quality Engineering Education
- Academic and Administrative reforms
- Equity and Inclusion
- Interdisciplinary research
- Expansion of access to Higher Technical Education
- Industry Academia interaction to analyze the changing demands of industry in order to supply high quality engineers.
- Excellence in research
- Network cluster among institutions for resource sharing
- Autonomy and Accountability.

The institutional development plan is well aligned with these goals stated above, as can be observed in the strategic plan, as presented in section 2.2.2.
In the strategic plan, the improvement in teaching learning outcomes will be carried out through

- modernization of existing laboratories, class rooms,
- up-gradation of library and research facilities,
- extensive and continual training of academic, technical and support staff.
- Increased interaction with industry

The IDP also stresses on the inclusiveness of the program, with the stated goal of attracting more students for post-graduate studies, and through support of weaker sections though remedial and finishing schools.
In the end, the improvements carried out will translate into a general improvement of the quality of education leading to higher employability, as well as increased intake in post-graduate courses.

2.10 Participation of the Departments / Faculty in the proposal preparation and Implementation

Initially a formal meeting was convened by the honourable Vice-Chancellor, West Bengal University of Technology to inform all the faculty members about the Phase II of TEQIP. A tentative schedule was decided for preparing the development plan of each department and the institute as a whole.
The Departmental Committee of each Department under the Technology faculty had prepared the development plan after a detailed analysis of strength, weakness, opportunity and the threats in context of each department. All possible stakeholders i.e. students, scholars, faculty-members, technical and supporting staff have participated in these brain storming sessions for preparing the SWOT analysis.
The pro-forma for TNA was supplied to each department. The registrar, finance and examination sections participated very actively for providing institutional and baseline data.

2.11 Institutional Project implementation arrangements

- The Executive Council of the West Bengal University of Technology will act as BOG for TEQIP and the Vice-Chancellor of the University will act as the chairman of BOG.

- Any administrative or financial decision regarding TEQIP will be approved by BOG.
- Sub-committees will be formed with the approval of BOG to look after different aspects and for the smooth running of the project.
- The names of the members of each committee will be nominated by respective Nodal Officers and will be approved by the BOG.
- Each committee should comprise representatives of all the stakeholders.
- Besides the specified committees, each department should specify name of a faculty member, endorsed by the Departmental Committee to look after the TEQIP-related matter. That faculty-member should preferably not be a member of the above committees.
- Committees will meet every month to look after their performance against specific targets and will submit monthly progress report to the BOG.
- It has been decided that the consultants may be recruited for procurement and finance mainly to look after the activities of the said cells with the adherence to the norms of the World Bank.
- A quarterly feed back from the stakeholders will be considered for smooth running of the project.
- The financial aspects of all the committees will be regularly audited by the internal auditor of the University.

Table -29

Institutional Project Budget for Sub-Component 1.1

(Rs. in Crore)

			Financial year				
S. No	Activities	Project Life Allocation	2010-11	2011-12	2012-13	2013-14	2014-15
1	Infrastructure improvements for teaching, training and learning through:						
	(i) Modernization and strengthening of laboratories	0.40		0.30	0.10		
	(ii) Establishment of new laboratories for existing UG and PG programmes and for new PG programmes	2.30		0.50	0.90	0.90	
	(iii) Modernization of classrooms*	0.30		0.20	0.10		
	(iv) Updation of Learning Resources	0.10		0.05	0.05		
	(v) Procurement of furniture	0.20		0.10	0.10		
	(vi) Establishment/Upgradation of Central and Departmental Computer Centers*	0.80		0.60	0.20		
	(vii) Modernization/improvements of supporting departments*	0.20		0.10	0.10		
	(viii) Modernization and strengthening of libraries and increasing access to knowledge resources	0.50		0.25	0.15	0.10	
	(ix) Refurbishment (Minor Civil Works)*	0.50		0.25	0.15	0.10	
2	Providing Teaching and Research Assistantships to increase enrolment in existing and new PG programmes in Engineering disciplines	1.00		0.25	0.25	0.25	0.25
3	Enhancement of R&D and institutional consultancy activities*	0.20		0.10	0.05	0.05	
4	Faculty and Staff Development (including faculty qualification upgradation, pedagogical training, and organising/participation of faculty in workshops, seminars and conferences) for improved competence based on TNA	1.00	0.04	0.25	0.25	0.25	0.21
5	5 Enhanced Interaction with Industry	0.40	0.02	0.10	0.10	0.10	0.08
6	6 Institutional management capacity enhancement	0.30	0.01	0.08	0.07	0.08	0.06
7	7 Implementation of institutional reforms	0.20		0.05	0.05	0.05	0.05
8	8 Academic support for weak students under the aegis of Finishing School	0.40		0.10	0.10	0.10	0.10
9	9 Technical assistance for procurement and academic activities	0.20		0.05	0.05	0.05	0.05
10	10 Incremental Operating Cost	1.00	0.04	0.25	0.25	0.25	0.21
	TOTAL	10.00	0.11	3.58	3.02	2.28	1.01

Revised Action Plan (Annexure - A)

2.13 Provide the targets against the deliverables listed in Table-30.

Table-30

Project Targets4 for Institutions under Sub-Component 1.1

S. No	Deliverables	Baseline	Targets to be achieved	
			At the end of 2 years of joining the Project	By project closing
1	Number of students registered for (a) Masters in Engineering programme (b) Doctoral programme in Engineering	 203 10	 225 15	 280 20
2	Revenue from externally funded R&D projects and consultancies in total revenue (Rs. in lakh)	394.26	440	485
3	Number of publications in refereed journals (a) National (Jr + Proc) (b) International (Jr + Proc)	 6 100	 8 110	 10 120
4	IRG as % of total annual recurring expenditure	300%	325%	350%
5	Number of co-authored publications in refereed journals (a) National (b) International	 4 30	 4+ 7 = 11 30 + 29 = 59	 11 + 10 59 + 41= 100
6	Student credentials (a) campus placement rate of • UG students • PG students (b) average salary of placement package for (Rs. in lakh) • UG students • PG students	 (a) 75% 20% (b) 2.2 lakh	 (a) 85% 50% (b) 2.5 lakhs	 (a) 95% 70% (b) 3.5lakhs
7	Number of collaborative programmes with Industry	4	6	8
8	Accreditation status (obtained and applied for)	0 4	Minimum 60% of UG + PG	100% of eligible UG + PG programmes
9	Vacancy position for faculty and staff		Vacancy reduced to 10% or less	Zero
10	Percentage of regular faculty having a Masters Degree or a Doctorate Degree in Engineering disciplines		Increased by 20% and 10% respectively over base line	Increased by 40% and 20% respectively over base line
11	Transit rate from 1st to 2nd year for the following: • All Students • SC and ST Students • OBC Students • Women Students	 100% 100% 100% 100%	 95.24 % 100% & 75 % 100% 100%	 100% 100% 100% 100%
12	Autonomy status	Autonomous	Autonomous	Autonomous
13	Enrolment of faculty with only Bachelor Degree for qualification upgradation	NA	NA	NA
14	Any other academic deliverables (maximum 3)		At least 50% at the parent institution or 25% at other institution	

2.16 SELECTED ACHIEVEMENTS BY INDIVIDUAL FACULTY MEMBERS

The faculty members of the Technology faculty of this University are associated with various academic activities like editing journals, organizing conferencing, leading professional bodies like Indian Science Congress, IEEE, Institute of Engineers, etc. Some of these activities are listed below.
The list is representative and many other achievements by the faculty members could not be included within the limited size of this document.

Debashis De:

a. Selected as Adjunct Research Fellow, University of Western Australia(2009)
b. Endeavour PostDoc Research Awsrd, DEST, Australia.(2009)
c. Published Two research Monograph in the Springer series in Nanotechnology and Material Science(2009)
d. Boyscast Fellowship(2008), DST, Govt. of India for Postdoc at Heriot Watt University,Edinburgh,Scotland, UK
e. Young Scientist Award, URSI General Assembly and Scientific Symposium, Belgium

Shaon Ray Chaudhuri

a. Selected as DBT-PDF in Life Sciences and Biotechnology during the inception of the program in 2001.
b. Selected for the Young Scientist Award under the DST Fast Track Scheme in 2003.
c. Participated in DAAD-DST exchange program as the an experimental biologist in the Bioinformatics program on ARB resulting in 21 as well as 30 days Bioinformatics training at Technical University of Munich, Germany during 10th March 2004 to 1st April 2004 and 30th December 2004 to 30th Jan 2005 respectively.
d. Awarded the DBT overseas associateship for young Scientist under the “specialized training in NICHE areas of Biotechnology 2007-2008” scheme at Humboldt University, Berlin by DBT 30th June 2008 onwards.
e. Reviewer for International Journal of Medicine and Medical Sciences.
f. Reviewer for Journal of Plant Breeding and Crop Science.
g. Guest Editor of Special issue of Online Journal of Biological Sciences as well as American Journal of Microbiology.
h. Obtained extramural grant of more than 1 crores since completion of PhD.
i. Member of the Executive committee of the Electron Microscope Society, Calcutta Chapter.
j. Life member of Association of Microbiologists of India,
k. Member of the Society of Wetland Scientists.
l. Appointed as Environmental Expert jointly by Department of Environment and European Union in 2008
m. Consultant to Intellectual Ventures Invention Network under the “Topic Plus Program” for patent generation”
n. Patent Reviewer for Intellectual Ventures Invention Network.
o. Filed four Indian Patents in 2010 with PCT filed for two of them.
p. Have been able to set up a state of art Anaerobic Microbial Technology Facility through extramural fundings.
q. Organized the largest hands-on workshop ever with 108 participants on prokaryotic whole cell visualization under Transmission Electron Microscope using the old Zeol S100 system available at WBUT.

Annexure -1

List of faculty members, department wise and designation wise

School / Department	Name of faculty member	Designation
Department of Comp. Sc. & Engg	Dr Sudakshina Kundu	Professor
Department of Comp. Sc. & Engg	Dr Sriyankar Acharya	Associate Professor
Department of Comp. Sc. & Engg	Dr Madhumita Das Sarkar	Associate Professor
Department of Comp. Sc. & Engg	Dr Debashis De	Associate Professor
Department of Comp. Sc. & Engg	Dr. Santanu Phadikar	Assistant Professor
Department of Comp. Sc. & Engg	Mr. Santanu Chatterjee	Assistant Professor
Department of Comp. Sc. & Engg	Dr. Koushik Majumdar	Assistant Professor
Department of Comp. Sc. & Engg	Mr. Saikat Basu	Assistant Professor
Department of Comp. Sc. & Engg	Mr. Mihir Sing	Assistant Professor
Department of Comp. Sc. & Engg	Mr. Subhanjan Sarkar	Assistant Professor
Department of Comp. Sc. & Engg	Dr. Suparna Biswas	Assistant Professor
Department of Biotechnology	Dr Jaya Bandyopadhyay	Assistant Professor
Department of Biotechnology	Dr Shaon Ray Chaudhuri	Assistant Professor
Department of Biotechnology	Dr Raja Banerjee	Associate Professor
Department of Natural Science	Dr Indranil Mukherjee	Associate Professor
Department of Natural Science	Dr Sreeparna Banerjee	Associate Professor
Department of Natural Science	Ms. Atreyee Biswas	Assistant Professor

Annexure II

A few highly acclaimed publications of the university faculty members International publication (2013-2014)

Annexure - III

Projects running during 2013-2014
