Revised Institutional Development Proposal
Submitted by

JNTUH COLLEGE OF ENGINEERING HYDERABAD
(Autonomous)
Kukatpally, Hyderabad-500085

under

Sub-component 1.3
Twinning Arrangements to Build Capacity and Improve Performance of Participating Institutes

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQIP)
PHASE-III

of

The Ministry of Human Resource Development, Government of India

Submitted through

GOVERNMENT OF TELANGANA

On

September, 2017

to

NATIONAL PROJECT DIRECTOR
NATIONAL PROJECT IMPLEMENTATION UNIT
Ed. CIL HOUSE, 4th FLOOR, PLOT NO. 18-A, SECTOR 16-A
GAUTAM BUDDHA NAGAR, NOIDA – 201 301, UTTAR PRADESH

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CERTIFICATE

Certified that the information provided in the proposal is factually correct to the best of our knowledge and wherever possible has been substantiated with the relevant documents.

The institution has not applied under TEQIP Sub Component 1.1and 1.2

All the stake holders (students, staff, parents, industry) were involved in the preparation of this proposal.

All the Faculty / departments are involved in the preparation of Institutional Development Proposal (IDP) and Project Implementation arrangements, Procurement Plan and Faculty Staff Development Plan (FSDP).

The autonomy status has already been granted by the University. The College was conferred autonomous status by UGC, New Delhi in 2010-11 for a period of six years. The Institute has again applied for Autonomous Status to UGC for exercising autonomy. Committee visit is expected soon.UGC status 2(f) is already granted.

of

Institution
PRINCIPAL
JNTUH College of Engg., Hyd.
Kukatpally, Hyderabad-085,
Telangana State.

Place: Hyderabad
Date: 19-02-2017

1. INSTITUTIONAL BASIC INFORMATION

1.1 Institutional Identity

- Name and address of the Institution : JNTUH College of Engineering Hyderabad, Kukatpally, Hyderabad– 500 085

- Year of establishment : 1965

- Is the Institution AICTE approved : **Yes (Enclosure-1)**

- Furnish AICTE approval No. : F-South-Central/1-2812724017 Dated 25-04-2016

  Type of Institution : Govt. funded
- Status of Institution : Constituent and Autonomous College of Jawaharlal Nehru Technological University - Hyderabad.

- Name and Designation of (Full Time appointee) : Dr.A.Govardhan, Professor of CSE & Principal Head of the Institution, JNTUH College of Engineering Hyderabad,

1.2 Academic Information:

- **Engineering UG and PG programmes offered in Academic year 2016-17:**

S.No.	Title of Programme	Level (UG, PG, PhD)	Duration (Years)	Year of starting	AICTE Sanctioned Annual Intake	Total Student strength in all years of study
I	B.Tech.					
1	Civil Engineering	UG	4	1965	60	410
2	Computer Science Engineering	UG	4	1984	60	
3	Electronics and Communications Engineering	UG	4	1973	60	
4	Electrical and Electronics Engineering	UG	4	1979	60	
5	Mechanical Engineering	UG	4	1965	60	
6	Metallurgical Engineering	UG	4	1989	50	
7	Chemical Engineering	UG	4	2014	60	

II	**M.Tech**					
1	Structural Engineering	PG	2	1990	25	425
2	Transportation Engineering	PG	2	2002	25	
3	Infrastructural Engineering **	PG	2	2009	25	
4	Geo technical Engineering	PG	2	2002	25	
5	Urban Transportation Engineering	PG	2		25	
6	Electrical Power Engineering	PG	2	2002	25	
7	Power Electronics	PG	2	2002	25	
8	Advanced Manufacturing Systems	PG	2	2003	25	
9	Energy Systems	PG	2	2003	25	
10	Engineering Design	PG	2	2010	25	
11	Thermal Engineering.	PG	2	2000	25	
12	Digital Systems and Computer Electronics	PG	2	1991	25	
13	Systems and Signal Processing	PG	2	2000	25	
14	Embedded Systems	PG	2	2009	25	
15	Computer Science	PG	2	2000	25	
16	Computer Science & Information Engineering	PG	2	1983	25	
17	Metallurgy	PG	2	2013	25	
III	**Integrated Dual Degree Program (IDP, B.Tech + M.Tech / MBA) **					
1	Civil Engineering	UG+PG	5	2009	18 / 12	150
2	Computer Science Engineering	UG+PG	5	2009	18 / 12	
3	Electronics and Communications Engineering	UG+PG	5	2009	18 / 12	
4	Electrical and Electronics Engineering	UG+PG	5	2009	18 / 12	
5	Mechanical Engineering	UG+PG	5	2009	18 / 12	
IV	**Ph.D**					
	Civil, CSE, ECE, EEE, Mechanical and Metallurgical Engineering	Ph.D	3 (Minimum)	2012	--	897**

**Students admitted under Full time and External registration

NBA Accreditation Status of UG and PG programmes as on 31st December 2016

Sl. No	Particulars	UG	PG
1.	No. of Programmes Offered	07	16
2.	Eligible	06	13
3.	Accredited	02	04
4.	Renewal Process(Re Accreditation)	04	09
5.	Percentage of accreditation (%)	94.7%	

Accreditation Status of UG Programs (Enclosure-2).

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
Computer Science Engineering	Yes	No	Applied for renewal
Mechanical Engineering	Yes	Yes	NA
Metallurgical Engineering	Yes	No	Applied for renewal
Electronics and Communications Engineering	Yes	Yes	NA
Electrical and Electronics Engineering	Yes	No	Applied for renewal
Civil Engineering	Yes	No	Applied for renewal

Accreditation Status of PG Programs (Enclosure-3).

Title of PG Programmes being offered	Whether eligible for accreditation or not	Whether accredited as on 31st December 2016	Whether "Applied for" as on 31st December 2016
Civil Engineering			
Structural Engineering	Yes	No	"Applied for" renewal"
Transportation Engineering	Yes	No	"Applied for" accreditation
Infrastructural Engineering	Yes	No	"Applied for" accreditation
Geo technical Engineering	Yes	Yes	NA
Electrical and Electronics Engineering			
Electrical Power Engineering	Yes	No	"Applied for" renewal
Power Electronics	Yes	No	"Applied for" renewal
Mechanical Engineering			
Advanced Manufacturing Systems	Yes	Yes	NA
Thermal Engineering.	Yes	No	"Applied for" renewal
Energy Systems	Yes	No	"Applied for" renewal
Engineering Design	Yes	No	"Applied for" accreditation
Electronics and Communications Engineering			
Digital Systems and Computer Electronics	Yes	No	"Applied for" renewal
Systems and Signal Processing	Yes	Yes	NA
Embedded Systems	Ýes	No	"Applied for" accreditation
Computer Science and Engineering			
Computer Science	Yes	No	"Applied for" renewal
Computer Science & Information Engineering	Yes	No	No

Status of Faculty Associated with Teaching Engineering Students (Regular & Contract) as on 31st December 2016:

R=Regular, C=Contract

Faculty Rank	No of Sanctioned Regular Post	Present Status: Number in Position by Highest Qualification												Total No of regular faculty in position	Total vacancies	Total No of contract faculty in position
		Doctoral Degree				Masters Degree				Bachelor Degree						
		Engg Discipline		Other Disciplines		Engg Disciplines		Other Disciplines		Engg Disciplines		Other Disciplines				
		R	C	R	C	R	C	R	C	R	C	R	C			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15=(3+5+7+9+11+13)	16=(2-15)	17=(4+6+8+10+12+14)
Prof.	32	60	2	7	-	-		-		-	-	-	-	67	-35	5
Asso Prof.	35	8	-	2	-	6		-		-	-	-	-	16	19	2
Asst. Prof	81	11	-	3	-	13		2		-	-	-	-	29	52	82
Lec	-	-		-	1	-	55	26								
Total	148	79	2	12	1	19	55	26		-	-	-	-	112	36	84

2. INSTITUTIONAL DEVELOPMENT PROPOSAL (IDP)
(Implementation period: April 2017- March 2020)

2.1 Summary of the IDP.

THE PROPOSAL:

JNTUH College of Engineering Hyderabad **(JNTUHCEH)** is submitting this proposal to participate in the Technical Education Quality Improvement Program (TEQIP) Phase–III under Twinning Arrangements to Build Capacity and Improve Performance of Participating Institutes for implementation during 2017 – 2020

BACKGROUND:

The JNTUHCEH with a history of over 50 years in technical education offering B.Tech, M.Tech. and Ph. D. Programs in Seven disciplines of Engineering has achieved a top-tier status among Engineering Colleges in the Country. Recent Survey of Best Engineering Colleges in India by outlook Magazine has placed the college in the list of 9th Place among all the Engineering colleges in India in the ranking of top Engineering College of super excellence. While rankings fluctuate, the college is widely perceived as a leading institute for the Undergraduate programs offered by it with the top 2000 rank holders of over 1.5 lakh students appearing for the state wide entrance Examination EAMCET making it to the admission into the various B.Tech. Programs offered by the college. The primary goal of the College over the next four years is to build upon the achievements to date and secure a position in the top ten Engineering Colleges in the country. The College has been sustaining and improving the quality of its UG programs. It now proposes to expand the scope, quality and multidisciplinary character of its PG and Ph. D programs while ensuring equity. JNTUH-CEH offers B.Tech. Programmes in 7 disciplines at UG Level; M.Tech. Programs in 19 disciplines, M.Sc. in 4 disciplines, M.C.A., M.B.A. at PG Level; in addition to the offer of M.S., M.Phil., Ph.D programmes in various disciplines of Engineering, Technology, Science and Management. The autonomy status has already been granted by the University. The College was conferred autonomous status by UGC, New Delhi in 2010-11 for a period of six years. The Institute has again applied for Autonomous Status to UGC for

exercising autonomy. Committee visit is expected soon.UGC status 2(f) is already granted **(Enclosure-4)**

The College has been sanctioned the First phase of TEQIP Project with a funding of Rs. 14.00 Crores and has been successfully completed in the year 2009. The College was selected as Lead Institute in TEQIP Phase-I. The second phase of the TEQIP Project for the duration of 2011-2016 has been sanctioned to the college with a funding of Rs. 12.50 Crores. This project is focusing towards the procurement of Laboratory Equipment, R&D activities, Industry Institute Interaction and Teachers Training. The funds received in the first phase were utilized effectively and received lot of appreciation from state and central agencies. The College has been sanctioned a Centre of Excellence in Disaster Management under TEQIP-II with funding of Rs. 5.00 Crores which is one out of 30 CoEs sanctioned by MHRD across India. JNTUHCEH is identified as well performing institute in TEQIP-II. Hence an additional amount of five crores is sanctioned.

The objective of the proposal for Twinning Arrangements to Build Capacity and Improve Performance of Participating Institutes. Activities suggested under the Scope of the Project are Procurement of Goods, Improvement in Teaching, Learning and Research competence: Improvement in student learning, Student employability, Increasing faculty productivity and motivation, establishing a twinning system, Twinning arrangements with institutions under Sub-component 1.1 to build capacity and improved performance.

Key features of the Proposal:

Subject up gradation and research competence: With the technological advancements in various departments, curriculum changes and research methodologies, advances in the research areas of priority in the department have been identified both in India and Abroad. It is also proposed to conduct and depute faculty to interact with industry to secure research projects on applied areas of Research. Special training to commercialize the research projects are also being planned for quick dissemination of research results to the society.

Pedagogical Training : With the availability of voluminous information on the web and other sources, availability of technologies such as ICT, it has been identified that there is an paradigm shift in the teaching learning process. Learning is now more of learning centric rather than teacher Centric. The students are now looking towards the teacher as a facilitator for blended learning. It is therefore proposed to train all the members of faculty on the Pedagogical Aspects.

Staff training (Technical & Administrative staff): With the up gradation of Infrastructure and Laboratories, Skill Up gradation of all technical Staff has been proposed. The requisite skills have been identified so that the trained staff can minimize the maintenance problems in the department as well as the college apart from making the UG and PG practical sessions effective.

Strengthening New PG programs: Many new PG programs have been initiated as a consequence of impact of TEQIP–I and TEQIP–II Reforms, taking into account the available opportunities and Strengths of the institute. It is proposed to strengthen the existing new PG programmes to meet the Industry needs.

Scaling Up Doctoral Enrolment: It is targeted to increase the full time research fellowships by 50 numbers in various specializations of ECE, CSE, EEE, Civil Engineering and Mechanical Engineering by the end of the project from the present status of 18 numbers apart from part time enrolment of Ph. D Scholars.

Scaling of PG and PhD enrollment: This is expected to increase the PG enrollment by about 50%. The Full time PhD fellowships are proposed to be increased by 50 numbers apart from part time PhD registrations which is expected to increase the Ph. D enrollment by 40 % by the end of the project

Equity Action Plan: To supplement the regular classroom teaching with small group and practicum oriented sessions to enhance learning of those students who cannot follow the course at the normal pace and mode of teaching .it is proposed to provide access and equal opportunities to all sections of the community implementing equity plan.

Academic Reforms: The Governing Body of the college is keen on implementing institutional reforms for enhancing the quality of the programs offered and accreditation of the courses. It is proposed to give autonomy of reasonable levels to the institute with suitable delegation of powers. The programs would gain recognition through accreditation. The vacancy position of the sanctioned strength is targeted to be decreased and faculty qualification up gradation.

Establishment of research labs: It is proposed to promote   multidisciplinary research specialized research labs in identified areas.

Organization and Attendance of Conferences and Workshops: It is proposed to Provide Travel grant and support to the faculty and research scholars for the publication of research work, networking and collaboration with Institutes of Research and Industry.

VISION

To be recognized as one of the top 10 institutes in the country offering Quality technical education, sustaining and improving its repute of Quality UG programmes, expanding and enhancing need based and quality PG and research programmes with global outlook, synergizing teaching and research for societal relevance.

MISSION

- *To identify technological advancements and build **the right level of skills at the right time** contributing to the industrial and national growth.*
- *To identify and keep abreast with the **state of the art technology maintaining** its legacy of striving for excellence in higher education.*
- *To promote **world class research** of local relevance to society*
- *With a research community of professors, research fellows and research centers, **expand the scale, quality and multidisciplinary** character of its research activities.*
- *With a **global outlook** strive for collaborations to network with International Universities and National Institutes of Research and Higher Learning.*

2.2 (a) Improving the learning outcomes of the students

1. **Faculty training:** Following activities are proposed to be conducted under Faculty training:

    (i)   Induction Programme

    (ii)   Qualification Up gradation,

    (iii) Subject up gradation & research competence

    (iv)   Pedagogical training

    (v)   Continuing Education Programmes (CEPs)

(i) Induction Programme:

Action Plan

- Identify mentor faculties (1:20)
- Training of faculty mentors by the induction coordinators who received training at regional workshops
- Conduct of induction programme for first year students.
- Identifying deficiencies in students about conceptual knowledge in Physics, Mathematics, Chemistry subjects & Communication Skills through survey or skill test
- Proficiency module as per the requirements of student (own faculty with honorarium/ hired experts)
- Student Feedback on induction training

(ii) Qualification Up gradation:

Already initiated activities:

- Many of the Faculty members have upgraded their qualifications from UG to PG and PG to Ph.D through Quality Improvement Programs.
- All the Faculty of all the Engineering departments are having M.Tech qualification. Each department of the college has a good number of doctorates (Approx. 90%). Further, with a strategic goal of increasing the PhD enrolment to enhance the research competencies in the identified thrust areas

- Faculty will be encouraged to upgrade their qualification from Masters to Doctoral degree. There are about 20 faculty members registered for Ph.D. These Faculty members would be supported by way of six month leave and financial funding for publication, attendance of Conferences and training abroad.

(iii) Subject up gradation and research competence:

Already initiated activities:
- With the technological advancements in various departments, curriculum changes and research methodologies, advances in the research areas of priority in the department have been identified both in India and Abroad.
- It is also proposed to conduct and depute faculty to interact with industry to secure research projects on applied areas of Research.
- Special training to commercialize the research projects are also being planned for quick dissemination of research results to the society.
- Faculty are attending the international conferences held in abroad and India
- The departments have been organizing the international conferences annually
- The faculty members are carrying out the research related to different funded projects
- All the departments completed good number of research projects presently around 20 research projects are ongoing in various departments.
- The institute has been continuously interacting in transferring the expertise in the form of consultancy and revenue of around Rs. 2.50 Crores per annum.
- Deputing the faculty to attend short-term and long-term courses are available within India.
- Deputing the faculty to attend Summer Schools arranged by Government organizations, institutions and professional Societies.
- Technical Fests are conducted regularly.
- Encouraging student projects beyond syllabus.

- All in-house innovative projects

- PG students are encouraged to register for PhD Programs with faculty.

- Student Publications are encouraged by sponsoring to conference or workshops or product design contest at IITs, NITs, etc.

Action Plan:

- The college proposes to enhance its collaborations with R & D Institutes, Research funding agencies and increase the publications in Refereed National and International Journals.

- To increase initiatives R & D collaborations in association with industry where Scholars can register for Ph.D

- A collaborative guidance to scholars along with industry experts by taking up R & D challenges of the industry and relevant to the society.

- To explore for training program at PG level beyond curriculum.

- Encouraging the students to take summer internship in industries.

- Encouraging the students taking up their project works related to industrial and societal needs.

- Facilitate the exchange of experts between institute and industry.

- Increase the consultancy services to external organizations including government, industry and the public sector.

- Seek associations with prominent organizations in the region.

- Map faculty to the organizations according to the areas of their research.

- Encouraging Industry Training in emerging fields, with internships and financial assistance and to facilitate learning by experience.

- Planning for collaborative research activity with industries and R&D units.

- Obtaining funding from various government/private/alumni funding agencies.

- Micro Funding from the institute will augment the research activities in the department.

- Faculty – Publishing in Reputed Journals to be incentivized by means of providing the additional facilities.

- To generate / create corpus fund for R & D works through consultancy services.

- Obtaining more number of Patents

- Appointing adjunct Faculty from R&D labs and Industry.

- Entering into MOU and harness facilities in R&D labs and industry.

(iv) Pedagogical Training:

Already initiated activities:

- With the availability of voluminous information on the web and other sources, availability of technologies such as ICT, it has been identified that there is an paradigm shift in the teaching learning process.

- Learning is now more of learning centric rather than teacher Centric. The students are now looking towards the teacher as a facilitator for blended learning. It is therefore proposed to train all the members of faculty on the Pedagogical Aspects.

- Eighty one (81) faculty members trained with teaching pedagogy in TEQIP II Project..

Action Plan:

- Deputing more number of faculty to the basic Pedagogical Training

- Deputing more number of faculty to the basic advanced Pedagogical Training

- Deputing faculty to the basic Subject/ Domain Specific Training

(v) Continuing Education Programmes (CEPs) :

Already initiated activities:

- Faculty have been attending workshops and conferences like IITs, IIMs, NITs & other reputed organizations, and interacting with peers from other places to abreast with the latest trends in technology.

- Faculty development and workshops are organized in collaboration with IIT Madras, IIIT Hyderabad in TEQIP-1

- Faculty have been attending various refresher courses

- Deputing the faculty to attend National and International Seminars, Conferences, Workshops, etc..

- Encouraging the faculty to visit close-by institutions and laboratories of his/her interest.

- Entering MoUs with various academic institutions and R&D organizations within and outside the country. MoU has been entered in collaboration with BTH, Sweden. Collaborations are being worked with other Universities, namely Cork Institute of Technology, Ireland, University of West Minster, London.

Action Plan:

- The faculty members have identified about 30 workshops and seminars in various disciplines to upgrade and network with various experts and Institutes in their areas of specialization and other areas where advancements are made.

- Planning for collaborative research activity with industries and R&D units.

- Pre-recruitment of staff against ensuing vacancies due to the retirement of Senior Faculty in important domains are to be conducted across the next ten years.

- **Industry Collaboration**: By the end of two years it is proposed that through interactions by way of monthly speaker series and Industrial Visits the problems of the Industry would be identified and MoU for joint research in 4 -5 key areas identifies shall be taken up.

- **Joint Publications** with networked Research and Academic Institutes. Several part time scholars of the college are working with co supervision from Industry and other academic Institutes/ Colleges. Interdisciplinary Research would be enhanced through these collaborations.

(vi) Introducing MOOCS & Digital Learning

SWAYAM:

Action Plan:

- Student & faculty registration on SWAYAM portal (https://swayam.gov.in)
- Establishment of Flipped Classroom (Computer Centre with internet &Audio-Visual room in Institute)
- Introducing flexibility of opting for credit transfer (As per UGC guidelines, 20% credit courses can be done through SWAYAM portal)

SWAYAM Prabha:

Action Plan:

- Setting of infrastructure for SWAYAM Prabha (TV set with setup box, as per the world bank guidelines)
- Registration of faculties on SWAYAM for course certification.

BAR CHART OF THE KEY ACTIVITIES PROPOSED FOR THE ACTION PLAN

Sl. No	Key Activities: FSD	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36
1	Basic Pedagogy	✓		✓		✓		✓					✓
2	Advanced Pedagogy									✓		✓	
3	Subject/ Domain Specific Training	✓		✓						✓			
4	Attending Workshops, Seminars and Conferences	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Research Competence									✓			
6	Skill Development		✓				✓				✓		
7	Entering MoUs		✓				✓				✓		
8	Collaborative R & D projects		✓				✓				✓		
9	Induction Programme												
10	MOOCS & Digital Learning												

2. Staff training (Technical & Administrative staff):

Already initiated activities:

- With the up gradation of Infrastructure and Laboratories, Skill Up gradation of all technical Staff has been proposed.
- The requisite skills have been identified so that the trained staff can minimize the maintenance problems in the department as well as the college apart from making the UG and PG practical sessions effective.
- A few Technical & Administrative staff are deputed to the Personality development programmes, Capacity building training programmes and Enhancing organization performance through ICT programmes under TEQIP-II.

Action Plan:

- Special training in accounting packages, Office tools and Office automation and governance tools has been proposed for all Office and Administrative staff. Training in personality Development is proposed for all supporting staff.
- It is proposed to depute the Technical & Administrative staff to the training Programmes on
- Skill Up gradation Programmes
- Technical training Programmes
- Accounting packages
- Office tools
- Office automation
- Governance tools
- Personality development Programmes.

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

(i) Strengthening New PG programs:

- Many new PG programs have been initiated as a consequence of impact of TEQIP–I and TEQIP–II Reforms taking into account the available opportunities and Strengths of the institute.

- It is proposed to strengthen the existing new PG programmes to meet the Industry needs.

(ii) Starting New PG programs:

- It is proposed to start new PG programmes of inter disciplinary nature by taking into account the   Industry needs and global trends in TEQIP-III

Already initiated programmes:

The following new PG programmes are started under TEQIP-II

- M.Tech (Computer Science & Information Engg.) has been introduced in academic Year 2014-15
- M.Tech Advanced Computing in collaboration with CDAC from the AY 2014-15
- M.Tech in Metallurgy Engineering (2013-14)
- 5 year Integrated Dual Degree Master Programmes(IIDMP) in Civil, ECE, EEE and CSE branches has been introduced in academic Year 2012-13 with BTH Sweden.
- 5 year International Dual Degree Master Programmes (IIDDMP) in Civil, Mechanical, ECE, EEE and CSE branches has been introduced in academic Year 2012-13(MOU with Asian Institute Technology, Bangkok)
- A new M. Tech (Design Engineering) has been introduced in academic Year 2011-12.
- A new M. Tech Embedded Systems (Inter - disciplinary) has been introduced in academic Year 2011-12.

Action Plan:

- To introduce more courses of interdisciplinary in nature.
- Increasing the no. of M.Tech. programmes of full time in collaboration with Industries Proposed to start new programmes, taking into account the Industry needs and global trends.

Proposed new PG(M.Tech) Programmes:

➢ Communication Technologies - ECE Department,

➢ Cyber Forensics and Information Security –CSE Department,

➢ High Voltage Engineering- EEE Dept.

➢ Control Systems Engineering- EEE Dept.

(iii) Modernization of PG Labs:

Already initiated:

- To keep abreast with the technological advancements the following PG labs are established under TEQIP-II to be modernized with latest Software's.
- It is proposed to procure state of the art equipments for all departments and ensuring 24x7 accesses in all labs with bio-metric access.

Established Labs during TEQIP-II:

➢ Advanced Communications & Networking lab - ECE Dept

➢ Physical Mett. Lab - Metallurgical Engg Dept.

➢ Ad-hoc & Sensor networks lab - CSE Dept.
➢ Wireless & Mobile communications lab - CSE Dept.
➢ Mobile Computing lab - CSE Dept.
➢ Data mining lab - CSE Dept.
➢ Power System Lab - EEE Dept.
➢ Kinematics & Dynamatics - Mechanical Engg Dept.
➢ Thermal Engineering lab -Mechanical   Dept.
➢ Computation lab - Mechanical Dept.
➢ Non Destructive Testing lab - Civil Engg. Dept .

(iv) Establishment of New PG Labs:

To enhance the quality of the PG programs and encourage live projects the following new labs are proposed in various departments.

Action Plan:

- To establish new labs with state of art facilities as per new CBCS syllabus (Multi-disciplinary labs).
- To establish more centers of excellence in the state of art technologies.

   Proposed new PG (M.Tech) Labs in TEQIP-III:

   ➢ Communication Technologies Lab – ECE Department,

   ➢ Advanced IC Engines Lab- Mechanical Engineering Dept.

   ➢ Advanced Thermodynamics Lab - Mechanical Engineering Dept

   ➢ Concrete Lab – Civil Engineering Dept.

   ➢ Welding Technology Lab- Metallurgical Engineering Dept.

   ➢ Power Quality Lab – EEE Dept.

   ➢ Power Converters Lab- EEE Dept.

   ➢ IoT Lab - CSE Dept.

- **Scaling Up Doctoral Enrolment:**

   It is targeted to increase the full time research fellowships by 50 numbers in various specializations of ECE, CSE, EEE, Civil Engineering and Mechanical Engineering by the end of the project from the present status of 18 numbers apart from part time enrolment of Ph. D Scholars.

- **Scaling of PG and PhD enrollment:**
   This is expected to increase the PG enrollment by about 50%. The Full time PhD fellowships are proposed to be increased by 50 numbers apart from part time PhD registrations which is expected to increase the Ph. D enrollment by 40 % by the end of the project.

- **Appointment of Visiting and Adjunct Faculty:**
   To benefit from the experience of the industry and academic experts, it is proposed to appoint visiting and adjunct faculty especially in the areas of specialization of the new courses proposed.

- **Attract quality Ph.D and PG Scholars:**

  To attract best students for the PG and Ph. D level, fellowships, incentives such as teaching assistance ships, pedagogical training and training abroad are proposed based on merit and relevance.

BAR CHART OF THE KEY ACTIVITIES PROPOSED FOR THE ACTION PLAN

Sl.No	Key Activity: Scaling up of PG and Ph.D enrollment	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36
1	Introducing New PG Programs:				✓								
2	Introducing New PG Labs				✓								
3	Modernization of PG Labs								✓				
4	Teaching Assistance ships to Non GATE Masters Students				✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Research Assistance ships to Ph.D scholars		✓						✓				
6	UG Research Projects / Workshops	✓	✓		✓	✓				✓	✓		
7	Travel Grants for Ph.D students										✓	✓	✓
8	Pedagogy Training for Doctoral Students										✓	✓	✓

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

(i) Establishing Smart Class rooms

Already initiated activities:

- e-Class room is established under TEQIP-I
- CEH has already established 24x7 computer labs

Action Plan:

- Established e-Class room to be modernized with latest technologies
- All the class rooms to be made equipped with LCD projection facility and with internet connectivity
- To implement the best pedagogy practices in the class rooms

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- To be extending e-class room

- To provide a access to all Research Labs./Centres to all UG students, with academic guidance and faculty supervision, for sustained R&D in interdisciplinary domains.

(ii) 24*7 broadband connectivity and Wi-Fi access in all academic and administrative   buildings and hostels:

Already initiated activities:

- Reliable broadband connectivity and net access with a good ISP are available in the campus. It will be further augmented with wireless connectivity and wi-fi enablement for the entire campus , allowing ubiquitous learning and conferencing procedures.

- Enabling the entire JNTUH campus to have broad-band connectivity with wired and wireless accesses and providing 24x7 free access for all the campus students, faculty and staff.

- To extending 24x7 Computer Centre with 150 more Systems.

(iii) Establishing e-library

Already initiated activities:

- Books, E-resources are already procured under TEQIP-II

Action Plan:

- To establish e-library with e-Books, e-journals and e-learning Software's and Databases**.**

- To be procurement of Automation Software's

5. Improving the academic performance of SC/ST/OBC/academically weak students through innovative methods, such as remedial and skill development   classes, peer assisted learning for increasing the transition rate, non cognitive skills and pass rate Finishing School:

The College organizes Finishing School with an aim to provide the necessary employability skills to the students through its Training and Placement Cell.

Already initiated activities:

- Conduct pre-assessment test to analyze, technical Competency, behavioral Skills, Analytical Skills and capability to adjust to working environment.
- Offer Specialized Programmes with the experts from Industry of the relevant area to match their needs on part-time basis or during vacation.
- Increase the Learning Resources in the Training and Placement Cell.
- Visit Industries and conduct study tours.
- Organize Campus Placement in the areas where the Skills developed can be utilized thereby enhancing the percentage of campus placement.

Equity Action Plan:

Action Plan:

- To conduct Remedial Coaching to all academically weak students
- To soft skills Training specially focused to students from rural areas.
- Identify the students requiring academic support by the result analysis of the first year itself to induct them into the main stream. Presently the transition rate of SC/ ST/ OBC and other academically weak students is 80%. It is proposed to increase this to 92% by the end of the project.

BAR CHART OF THE KEY ACTIVITIES PROPOSED FOR THE ACTION PLAN
KEY ACTIVITY: Equity Action Plan

Sl. No	Key Activities	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36
1	Identification of weak students			✓				✓				✓	
2	Remedial Coaching					✓	✓			✓	✓		
3	Pre assessment test				✓				✓				✓

4	Identification of Faculty Needs		✓	✓							✓	✓	
5	Finishing School			✓				✓				✓	

6. Instituting academic and non-academic reforms including NBA accreditation, programme flexibility (Is there any need to revise the curriculum? When it was last revised?)

- Curriculum was revised in the Academic year 2015-16 for both UG and PG programmes
- UG/PG Syllabus is revised once in every 2 or 3 years
- CBCS (Choice Based Credit System) is implemented for all UG & PG programs from the AY 2015-16

6(a) Academic Reforms:

(i) Curricular Reforms:

Already Initiated Activities:

- UG/PG Syllabus is revised once in every 2 or 3 years
- CBCS (Choice Based Credit System) is implemented for all UG & PG programs from the AY 2015-16
- In A.Y.-2013 - 5 Theory + 3 Laboratories structure has been implemented instead of 6 Theory + 2 Laboratories in each semester
- More number of open electives are introduced.
- Plagiarism check is introduced for the evaluation of PG project work
- Credit transfer system implemented for Collaborative Programmes offered with collaboration of Foreign Universities
- In End examination of M.Tech program Question Paper pattern is changed.
- New PG programs are started
- New laboratories are established

Action Plan:

- To introduce more courses of interdisciplinary in nature.
- To start the blended learning and flipped learning
- Organizing workshops for faculty so as to implement AICTE model curriculum.

- Deliberations on feasibility of implementing model curriculum and incorporating appropriate changes on the basis local needs.
- Considering introduction of innovation component based on local needs In the institute curriculum. Considering interlinking of GoI initiatives with curriculum (Digital India, Make in India, Start-up etc)
- Identify industry experts for formation of subject wise Industry Consultation Committee (ICC) .
- Communication & follow up with identified members for their acceptance. Suggested functions:

  - Revision of curriculum
  - Vetting of PEO, PO, CO
  - Activities for industry institute interaction
  - Guidance/assistance on internships and placement
  - Finishing courses: design and implementation
  - Industry expert lectures, Student and faculty visits to industries
  - Final year projects with sponsorships
  - Collaborative research/consultancy for students and faculties
  - Providing technical inputs to start-ups.

(ii) Performance appraisal of faculty by students:
- Feedback forms are collected on line at the end of each semester from students & are analyzed. The faculty are apprised of the same.

(iii) Faculty incentive for Continuing Education (CE), Consultancy and R&D:
- As a policy, Institute encourages the faculty to acquire higher qualifications.
- 40% of the savings will be given to the team involved in that consultancy.
- 6 months paid leave for the faculty pursuing PhD.
- Faculty will be encouraged to attend conferences and workshops.

6(b) Non Academic Reforms:

The following Non academic reforms are implemented in the institute in TEQIP-I and TEQIP II. It is proposed to further strengthening these activities by Filling-up existing teaching and staff vacancies in TEQIP III

(i)NBA accreditation:

Already Initiated Activities:

- All UG programs of Engineering departments, viz., Civil, Mechanical, Electronics and Communications, Electrical and Electronics, Computer Science and Metallurgy have been accredited by NBA since 2005. 9 PG programmes also accredited in 2013.

- NBA renewal for 4 UG (Civil Engineering, CSE, EEE and Metallurgical Engineering Departments) programmes is in process also NBA Applications of 9 PG Specializations is in process.

- Identifying faculty coordinator for institute as well as for each eligible department

- Conduct workshop for faculty on accreditation procedures & Norms

- Develop Vision & Mission statements, short term goals, strategies etc

- Formulate course outcomes, program outcomes & program education objectives

- Design & implement different formats/ rubrics for student assessment with respect to program outcomes

- Conduct Industry meeting & record minutes

- Conduct Alumni Meetings & record outcomes

- Develop feedback mechanism for collecting response of students, alumni (Tracer Studies), employers etc (through google forms)

- Prepare documentation for filling Self-Assessment Report (SAR)

- Prepare Institute in terms of laboratory & required documents for teaching & learning process (Laboratory, classrooms, Lab-manuals, Library Digitization, Computer Centre, Infrastructure Utilization, Faculty Profile, R&D Outputs, Student Projects, Industry Linkages etc)

- Appointment of faculty for filling up vacant positions so as to maintain desired student teacher ratio (1:15 UG & 1:12 PG) and also faculty cadre ratio (1:2:6)

- Uploading SAR and Payment of accreditation fees
- Preparation of Accreditation Visit

Action Plan:

(i) Exercise of autonomies

(ii) Establishment of Corpus Fund, Faculty Development Fund, Equipment Replacement Fund and Maintenance Fund

(iii) Generation, retention and utilization of revenue generated through variety of activities

(iv) Filling-up existing teaching and staff vacancies

(v) Delegation of decision-making powers to senior institutional functionaries with accountability.

2.2(b) Improving employability of the students:

1. Increasing interaction with industry

Already Initiated Activities:

- Students are taking up internship in core industries for the mini & major projects.
- Industry visits are arranged to create intern among the students towards industry / real time works.
- Industry Institute interaction cells are created in each department.
- Industry Advisory Committee meetings are conducted and identified the short-falls in this direction.
- JNTUH-CEH continues to provide unrestricted channel connections with Research Institutes and Industrial Sectors, for the continuous up gradation of knowledge base, enrichment of the Research Centres for Excellence.
- An Entrepreneurship Development cell is available in the University College.
- Entrepreneurship Development Programs, Faculty Development Programs are conducted regularly.

- MSME projects and Technology Business Interaction (TBI) scheme are in place at EDC.
- An Ideation centre has been started in the department and functioning in the department

(i) Start-Up:

Action Plan:

- Appoint faculty coordinator/advisor
- Establishing Start-up cell/club with participation of students
- Identify location for Innovation and Start-up cell/club for students (Including equipment and furniture like computer, Wi-Fi, table, chair, printer, stationary)
- Awareness drive/ workshops about the idea of 'Innovation' & 'Start-up'
- Identification of different problems in local/national areas to be worked upon (Identification of Innovation/start-up ideas)
- Need of hour based Curriculum motivating students to generate innovative ideas
- Setting up of Tinkering Labs in institutes.
- Continuous Drive of Competitions: Idea stage, prototype stage, business plan, etc. every month
- Providing seed money to students for their projects. (Incentivisation through prizes, academic credits, appreciation, attendance relaxation etc.)
- Expert Lectures promoting innovation Motivation of students through local entrepreneurs
- E-summits, conferences, seminars and other Entrepreneurship fests (organizing as well as attending)
- Exposure visits to start-ups, incubation centers, venture capitals, incubation/research parks

(ii)Industry Readiness:

Already Initiated Activities:

- Establishing Training and Placement Cell (with students and faculties)

- Identifying requirements of students for making them industry ready through a team of faculty/external agency(as per world bank guidelines)

- Separate module & Training on leadership skills, entrepreneurship skills, managerial skills, communication skills, collaborative skills, etc. individually or collectively

- Organizing pre-placement programs for the students.

- Setting up Language Labs for communication skills.

- Organizing mock Interviews and Group Discussions.

- If required arrange crash courses on technical topics of respective disciplines. (Technical Refresher Courses)

(iii) Mandatory Internship:

Already Initiated Activities:

- Identifying faculty coordinator

- Prepare discipline specific list of industries/ companies/ organizations (small scale, MSME, large scale, Internshala etc.)

- Updating your own website with all the details of students (contact info, CV, performance etc.) and preparing training and placement brochures

- Communication with the industries/ organizations/ companies with institute details and student profiles.

- Communication with Board of Apprenticeship Training for exploring additional avenues.

- MoU/ Agreement signing with the industries

- Awareness workshops for students to inform them regarding the different career paths.

- Arrange industry conclave

- Categorize students to take up internships depending upon the interest of the students (A survey could be done to identify interest of the students).

- Display of allocation of industry for internships (with proportionate funding)

- Issue of letters/NOC to the students and copy to industry.

- Seeking assistance from the mentor institution, where ever required.

- Encouraging the students to take summer internship in industries.

- Encouraging the students taking up their project works related to industrial and societal needs.

- Facilitate the exchange of experts between institute and industry.

- Encouraging Industry Training in emerging fields, with internships and financial assistance and to facilitate learning by experience.

- To establish innovation centre at Department level.

- To provide all latest version software packages

- To provide exclusive Incubation Space for thrust areas of the Departments.

- It is proposed to appoint Industry chair to each department

- It is also proposed to establish Incubation Centre

- To organize monthly speaker series for each of 4-5 key areas identified.

- To establish Interdisciplinary student teams in consultation with industry mentors with a faculty advisor assigned to each team

- To establish Industry liaison cell with student, faculty representatives to work with industry to identify need based courses

- Industry specific research projects to be identified – proactively using market needs and student/faculty competencies and their ability to solve industry specific engineering challenges.

- To Strengthen Entrepreneurship cell with focus on boot camps, periodic seminar on technology transfers, industry trends, establishing linkages to other student communities

- To plan and execute industry/cross institutional day

- Establish continuing education cell , develop and deliver industry specific short term courses (1-3 days) in consultation with the industry

Expected Outcomes: The expected outcomes of the Industry Institute Interaction are
- Funding for Research Projects
- Translation of Ideas to Products
- Strengthen Students Internships
- Research Fellowships
- Technology Incubation

- Commercialization of Research Outcome

BAR CHART OF THE KEY ACTIVITIES PROPOSED FOR THE ACTION PLAN

S. No.	Key Activities: Improving Collaboration with Industry	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36
1	Establishment of Industry Liaison cell	✓											
2	Establishment of continuing education cell						✓						
3	Strengthening Entrepreneurship cell						✓	✓					
4	Bridge Course		✓				✓				✓		
5	Interaction Seminars			✓				✓				✓	
6	Identification of Areas monthly Speaker Series	✓					✓				✓		
7	Establishment of Innovation Centre		✓										
8	Start up												
9	Introducing Readiness												
10	Mandatory Internship												

2. Student career counselling and placement

Already initiated activities:

- The Training & Placement Cell of this college is headed by a Faculty who will execute the activities of Conducting campus recruitments by inviting various companies
- Major MNC Companies are visiting the campus regularly for campus recruitment
- JNTUHCEH has 95% UG placements and 70% PG placements every year.

- Finishing schools for UG and PG students on Professional skills, Communication skills and Technical skill development programmes are conducted regularly.

- For every ten students one faculty advisor is appointed

Action Plan:

- To increase the PG placement rate

- To increase the PG and UG placements in Core companies

- Full harnessing of Alumni potential.

2(c) Increasing faculty productivity and motivation

1. Sponsored research, consultancy and other revenue generating activities

With a strategic goal to enhance the research competencies in the identified thrust areas and increase in PhD enrolment, the college proposes to enhance its collaborations with R& D Institutes, research funding and increase the publications in refereed national and International Journals. It is expected to increase the research funding by about 75% by the end of the project and consultancy by about 200% and significantly increase the publications and other research outcome.

Already initiated activities:

- The College has established four funds namely Corpus fund, Staff development fund, Equipment replacement fund and Maintenance fund in TEQIP-II.

- The Internal Revenue Generation (IRG) of the College which amounts to Rs. 724 Lakhs is distributed to four funds in the ratio of 10% for Corpus fund, 20% for Staff Development fund, 20% for Equipment replacement fund, 10% for Maintenance fund, 20% for University Development fund and 20% for College Development fund

Action Plan:

- The present IRG of the College is expected to be stepped up by 200% by the end of three year period.

Research Fellowships: It is targeted to increase the full time research fellowships by 50 numbers in various specializations by the end of the project from the present status of 18 numbers.

Establishment of research labs: To promote multidisciplinary research specialized research labs in identified areas.

Organization and Attendance of Conferences and Workshops: Provide Travel grant and support for publication of research work, networking and collaboration with Institutes of Research and Industry.

Training for Patenting Work: Special short term workshops and training programs are proposed to be organized to faculty so that they are equipped with suitable knowledge of the processes to translate their ideas and research to socially useful and industry relevant products.

Institutional project budget

The detailed budget is presented as follows.

Institutional Project Budget

S. No.	Key activities	Category of Expenditure (Head of expenditure)	Percentage (%)	Cost (Rs. in crore)
1	• Establishment of New PG Labs • Starting of New PG Programmes • Procurement of Automation Software • Establishment of e-library • Modernization of existing Laboratories • Modernization and extension of existing e-class room • Modernization of 24x7 centralized Computer Centre • Extension of 24x7 centralized Computer Centre • civil works for improvement in teaching, training and learning facilities	Procurement	50%	3.50

2	Improvement in Teaching, Learning and Research competence'
	▪ Improve student learning
	▪ Student employability
	▪ Increasing faculty productivity and motivation
	▪ Establishing a twinning system
	
	   ○ Twining arrangements with institutions under Sub-component 1.1 to build capacity and improved performance
	   ○ Individual institutional mentors
		Academic	40%	2.80

3	Incremental Operating Cost	IOC	10%	0.70
TOTAL			**100**	**7.00**

2.3 Describe the following in brief:

1. Is there an ERP/MIS system existing, if yes, then any improvement, modification suggested.

Yes.

It is proposed to enhance the existing system with Automation, paperless office, introducing surveillance system

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

No.

Presently UG students of various disciplines are getting considerable number of GATE ranks. It is proposed to increase the number by providing the special training to the students.

2.4 Endeavours and joint activities that we would undertake with the institution of focus state under sub-component 1.1 for twinning arrangement from among the ones listed below and/or any further ones and provide the yearly action plan for 3 years:

S. No	Suggested Activity/Indicator	Proposed Action	Target (number, %age, stage etc.) for institution under sub-component 1.1 over the baseline, if applicable

			2017-18	2018-19	2019-20
1	Increase in student graduation rates	--	--	--	--
2	Improved Placement of graduates a) Placement Rate b) Placement Package	--	--	--	--
3	Increase in GATE qualified graduates	--	--	--	--
4	Smart classrooms	--	--	--	--
5	e-books and e-Journals	--	--	--	--
6	Increase in publications in refereed journals	refereed journal publications	02	04	06
7	Seminars, meetings and conferences for students and faculty for training and academic development	Seminars, Conferences, students and faculty training	06	08	10
8	Sharing of faculty for teaching processes	Faculty for Teaching Process	03	04	04
9	Faculty exchange for research and development purposes	Faculty Exchange	02	03	04
10	Student exchange at the PhD, Masters and Undergraduate levels	Student Exchange	01	02	03
11	Joint supervision of PhD and/or Masters' student	Joint supervision	05	05	05
12	Joint activities with industry for joint R&D, internships and placement activities	Joint activities with industry	04	04	04
13	Seminars and learning forums on improving governance practices	Seminars and learning forums	02	02	02
14	Improvement in NBA accreditation (including applied for cases)	NBA accreditation	60%	70%	80%
15	Helping in Grant of UGC Autonomy for non-autonomous institution	UGC Autonomy	100%	100%	100%
16	Any other form of endeavour	Joint R7D Projects	03	04	05

2.5 Outreach programmes and systems which are already in place in our Institute to succeed in our role of twinning for strengthening of other

institutions viz. related to faculty/students/non-teaching staff/Industry etc.

Already initiated activities:

- Conducted special classes for approximately 40-50 SC/ST Students in the academic year 2013-2014 to face competitive exams such as GENCO, TRANSCO etc.

- Awareness of technological needs of the society.

- A training program is conducted to the housewives on desktop skills.

- A training program is conducted to the police personnel on IT at A.P. Police Academy (APPA).

- Training programs are conducted by the faculty to the census enumerators of 2011 census under the direction of GHMC.

- Mobile applications such as She-App and Rescue Assistant are developed by the students.

- Skill Development Programmes to unemployed youth are conducted in the areas of Refrigeration and Air-Conditioning Automobile Maintenance Awareness Programme for Senior Citizens.

- Organized Cloud Computing Experts Course for SC/ST students.

Action Plans:

- To develop campus Radio, free mobile connections with in campus.

- Design gadgets for physically challenged people.

- Prizes to be given for special recognition in academic excellence.

- Study the local community issues and develop apps to meet these issues.

- Taking feedback from various groups of society regarding usage of technology and their needs in daily life.

- Finding challenges being faced in Hyderabad city, district and State and find solutions

2.6 Identify the academic and/or administrative challenges that you anticipate in your role of twinning and the mechanism that you have put in place and/or intend to put in place, to address these challenges.

To provide effective mentoring to the identified the Institutes without disturbing the academic and administrative works of the home institute.

To improve the performance of the identified mentoring institutions as per the specified time limit and targets.

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

No, there is no difficulty in Recruitment and selection of high-quality faculty.

2.8 Give an action plan for long term strategic partnership with the mentee institute after the end of the Project.

Action plan for long term strategic partnership with the mentee institute after the end of the Project.

- Sharing of faculty for teaching processes
- Faculty exchange for research and development purposes
- Student exchange at the PhD, Masters and Undergraduate levels
- Joint supervision of PhD and/or Masters' student
- Joint activities with industry for joint R&D, internships and placement activities
- Seminars and learning forums on improving governance practices

2.9 Describe briefly the participation of departments/faculty/students in the IDP preparation.

In the **first stage** heads of the Departments were involved in several discussions sessions in phases. The focus on improving the Quality of its Post Graduate and Research Programs while sustaining its quality of Undergraduate Programs has been arrived at. Specialized and need based and interdisciplinary PG programs in various areas of Specialization have been identified. The course structure, curriculum along with Staff and Laboratory Requirements of these Programs have been elicited by the concerned departments..

To improve the quality of education and provide the requisite hands-on, the **second stage** of the process involving discussions at the Department level,

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proposals were submitted for the procurement of Infrastructural Facilities for establishment of new Labs and Removal of Obsolescence and modernization of the existing Labs.

The **third Stage** of the Planning Process involved the conduct of Training Need Analysis to elicit the training requirements of Teaching, Non-teaching, Contract Faculty and PG/Research Scholars of the institute. The requirements obtained by this process are categorized into Pedagogical, Institutional Management Capacity Building, Technical and Skill Development Categories.
The proposal is consistent with the core principles of the TEQIP–III Project, State objectives and is built on the strengths and opportunities of the College analyzing its weakness and threats. The proposal is a collective and comprehensive effort of all the staff members of the college towards realizing the vision of the College.

The Analysis done at all the stages is consolidated by the Principal and the Nodal Officer / Assistant Nodal Officer TEQIP.

The Heads of the Departments and the department TEQIP Coordinators acted as an interface to appraise and communicate the consolidation and the prioritization of the proposals received from the members of their faculties.