TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQIP- PHASE-II)

REVISED INSTITUTIONAL DEVELOPMENT PROPOSAL
for
Sub-Component 1.2: Scaling-up Post Graduate Education
and
Demand-driven Research & Development and Innovation

SIDDAGANGA INSTITUTE OF TECHNOLOGY, TUMKUR
(An Autonomous Institution, Affiliated to Visvesvaraya technological University, Belgaum and Recognized by AICTE and Accredited by National Board of Accreditation, New Delhi)
B. H. ROAD, TUMKUR- 572 103, KARNATAKA, INDIA

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1. INSTITUTIONAL BASIC INFORMATION

1.1 **Institutional Identity** : **Siddaganga Institute of Technology**

- Name of the affiliating university : **Visvesvaraya Technological University, Belgaum**
- Is the institution AICTE approved? : **Yes**
- Furnish AICTE approval no. : NBA/ACCR-284/2003; dt.12.9.2007
  NBA/ACCR-284/2007; dt.25.5.2009
  NBA/ACCR-284/2007; dt.19.7.2008
- Type of Institution : Private unaided
- Status of Institution : Autonomous Institute as declared by University

- **Names of Head of Institution and Project Nodal Officers**

Head & Nodal Officers	Name	Phone Number	Mobile Number	Fax Number	E-mail Address
Director & Project Authority	Dr. M.N. Channabasappa	0816 – 2282588, 2214080, 2214000	99002-50045	0816 – 2280995	director@sit.ac.in, mnc_sit@hotmail.com
TEQIP Coordinator	Dr. S.V. Dinesh	0816-2282695	94498-52695	0816 – 2280995	dineshsv2004@yahoo.com, teqip@sit.ac.in
Project Nodal Officers for:					
Academic Activities	Prof. Basavarajaiah	0816-2214006, 2214000	99002-50046	0816 – 2280995	basavarajaiahs@yahoo.com
Civil Works including Environment Management	Prof. B. Gangadharaiah	0816-2280452	94486-60531	0816 – 2280995	
Procurement	Dr. Shivakumaraiah	0816-2214001, 2214000	96633-67140	0816-2282994	principal@sit.ac.in, sksittum@yahoo.com
Financial Aspects	Prof. M. Ajoy Kumar	0816-2214089	98861-45620	0816-2214098	ajoymk@rediffmail.com
Equity Assurance Plan Implementation	Dr. T. Gangadharaiah	0816-2214030	94486-03761	0816 – 2280995	tganga@iitk.ac.in

1.1 Academic Information

- **Engineering programmes offered in Academic year 2009-10**

Sl. No	Title of programmes	Level (UG, PG, PhD)	Duration (Years)	Year of starting	AICTE sanctioned annual intake	Total student strength
1	B.E. in Biotechnology	UG	4	2006	30	101
2	B.E. in Chemical Engineering	UG	4	1974	60	217
3	B.E. in Civil Engineering	UG	4	1963	60	261
4	B.E. in Computer Science & Engineering	UG	4	1986	120	527

5	B.E. in Electrical & Electronics Engineering	UG	4	1963	60	265
6	B.E. in Electronics & Communication Engineering	UG	4	1967	120	530
7	B.E. in Industrial Engineering & Management	UG	4	1986	60	244
8	B.E. in Information Science & Engineering	UG	4	1999	60	261
9	B.E. in Instrumentation & Electronics Engineering	UG	4	1979	60	256
10	B.E. in Mechanical Engineering	UG	4	1963	140	629
11	B.E. in Telecommunication Engineering	UG	4	2000	60	259
12	M.Tech. in Structural Engineering	PG (Full-time)	2	1992	18	29
13	M.Tech. in Chemical Engineering	PG (Full-time)	2	1992	18	21
14	M.Tech. in Thermal Engineering	PG (Full-time)	2	2003	18	32
15	M.Tech. in Computer Science & Engineering	PG (Full-time)	2	2006	18	36
16	M.Tech. in Signal Processing	PG (Full-time)	2	2008	18	36
17	M.Tech in Thermal Power Engineering	PG (Part-time)	3	2006	18	16#

Offered as VTU extension centre

- **Ph.D Programmes offered in Academic year 2009-10**

S. No	Department	Year of starting	Part-time students	Part-time Joint Ph.D Candidates	Total
Engineering Departments					
1.	Mechanical Engineering	2000-01	9	6	15
2.	Civil Engineering	2000-01	4	3	7
3.	Chemical Engineering	2000-01	1	2	3
4.	Computer Science & Engineering	2003-04	9	0	9
5.	Electronics & Communication	2005-06	2	2	4
6.	Instrumentation & Electronics Engineering	2005-06	3	0	3
Basic Sciences					
7.	Mathematics	2005-06	4	0	4
8.	Physics	2005-06	2	0	2
9.	Chemistry	2005-06	2	0	2
	Total		**36**	**13**	**49**

- **Accreditation Status of UG programmes:**

Sl. No	Title of UG programmes being offered	Whether eligible for accreditation or not	Whether accredited as on 31st March 2010	Whether "Applied for" as on 31st March 2010
1	B.E. in Biotechnology	No#	--	--
2	B.E. in Chemical Engineering	Yes	No*	No
3	B.E. in Civil Engineering	Yes	Yes	-
4	B.E. in Computer Science & Engineering	Yes	Yes	-
5	B.E. in Electrical & Electronics Engineering	Yes	Yes	-
6	B.E. in Electronics & Communication Engineering	Yes	Yes	-
7	B.E. in Industrial Engineering & Management	Yes	Yes	-
8	B.E. in Information Science & Engineering	Yes	Yes	-
9	B.E. in Instrumentation & Electronics Engineering	Yes	Yes	-
10	B.E. in Mechanical Engineering	Yes	Yes	-
11	B.E. in Telecommunication Engineering	Yes	Yes	-

It will become eligible for accreditation in August 2011
* It was not possible to apply before 31st March 2010 due to some technical problem with the AICTE website. It was subsequently applied on 05-08-2010

- **Accreditation Status of PG programmes:**

S. No	Title of PG programmes being offered	Whether eligible for accreditation or not	Whether accredited as on 31st March 2010	Whether "Applied for" as on 31st March 2010
1	M.Tech. in Structural Engineering	Yes	Yes	-
2	M.Tech. in Chemical Engineering	Yes	Yes	-
3	M.Tech. in Thermal Engineering	Yes	Yes	-
4	M.Tech. in Computer Science & Engineering*	No	-	-
5	M.Tech. in Signal Processing*	No	-	-
6	M.Tech in Thermal Power Engineering (Part-time)	Accreditation not required as it is a University Extension Centre		

*Both these programmes will become eligible for accreditation in August 2011
Note: Please refer **Annexure 1** for accreditation records

1.1 Faculty Status (Regular/On Contract Faculty as on March 31st, 2010)

Faculty Rank	No. of Sanctioned Regular Posts	Present Status : Number in Position by Highest Qualification												Total Number of regular faculty in Position	Total Vacancies	Total Number of contract faculty in Position
		Doctoral Degree				Masters Degree				Bachelor Degree						
		Engineering Disciplines		Other Disciplines		Engineering Disciplines		Other Disciplines		Engineering 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+1 4)
Prof	35	36	1	6	1	4	2	1						47		4
Asso Prof																
Asst Prof	66	3		4		65		6	1					78		1
Lec	127			2		68	5	5		32				107		5
Total	228	39	1	12	1	137	7	12	1	32				232		10

Prof = Professor, Asso Prof = Associate Professor, Asst Prof = Assistant Professor, Lec=Lecturer, R=Regular, C=Contract

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

Sl. No.	Parameters	
1.	Total strength of students in all programmes and all years of study in the year 2009-10	3704
2.	Total women students in all programmes and all years of study in the year 2009-10	813
3.	Total SC students in all programmes and all years of study in the year 2009-10	264
4.	Total ST students in all programmes and all years of study in the year 2009-10	68
5.	Total OBC students in all programmes and all years of study in the year 2009-10	708
6.	Number of fully functional P4 and above level computers available for students in the year 2009-10	1358
7.	Total number of text books and reference books available in library for UG & PG students in the year 2009-10	82,769
8.	% of UG students placed through campus interviews in the year 2009-10	69%
9.	% of PG students placed through campus interviews in the year 2009-10	25%
10.	% of high quality under Graduates (>75% marks) in the year 2009-10	34.37%
11.	% of high quality postgraduates (>75% marks) in the year 2009-10	55.56%
12.	Number of research publications in Indian refereed journals in the year 2009-10 (# Indicates the number of publications with impact factor, however we have a total number of **5 publications** in Indain journals in 2009-10)	1#
13.	Number of research publications in International refereed journals in the year 2009-10 (# Indicates the number of publications with impact factor, however we have a total number of **35 publications** in International journals in 2009-10)	23#
14.	Number of patents obtained in the year 2009-10	Nil#

Sl. No.	Parameters	
	# (However, 11 patents were obtained between 2001 and 2006)	
15.	Number of patents filed in the year 2009-10	Nil
16.	Number of sponsored research projects completed in the year 2009-10	11
17.	The transition rate# of students in percentage from 1st year to 2nd year in the year 2009-10 for : (i) all students (ii) SC (iii) ST (iv) OBC # Transition rate is defined as the percentage of students who cleared all the subjects in first attempt.	 65.35% 37.04% 81.82% 80.99%
18.	IRG from students fee and other charges in the year 2009-10 (Rs. in lakh)	2334
19.	IRG from externally funded R&D projects, Consultancies in the year 2009-10 (Rs. in lakh)	24
20.	Total IRG in the year 2009-10 (Rs. in lakh)	2358
21.	Total annual recurring expenditure of the applicant entity in the year 2009-10 (Rs. in lakh)	1748
22.	Number of Joint publications with National authors in the year 2009-10	24
23.	Number of Joint publications with International authors in the year 2009-10	0
24.	Number of R & D products commercialized in the year 2009-10	2
25.	Number of Joint MTech programmes with institutions undertaken in the year 2009-10	15
26.	Number of joint MTech programmes with Industry undertaken in the year 2009-10	3
27.	Number of joint PhD with institutions undertaken in the year 2009-10 (12 candidates registered during earlier years are pursuing joint Ph.D with institutions)	1*
28.	Number of joint PhD with Industry undertaken in the year 2009-10 (@ 3 students are pursuing Ph.D. in collaboration with industry in civil, chemical & electronics & communication engineering)	Nil@
29.	Number of joint consultancies undertaken with institutions in the year 2009-10	1
30.	Number of joint consultancies undertaken with Industry in the year 2009-10	2

1.3 Institutions to be eligible for participation in the Project under the Sub component 1.2 must fulfill the following benchmarks:

Benchmarks for Institutions to Quality for Sub-component-1.2

Sl. No.	Attainment Parameters	Benchmark values	Institution's response (Yes/No)
1	Does the institution agree to implement all academic and nonacademic reforms given as below: • Implementation of curricular reforms • Exercise of autonomies • Establishment of Corpus Fund, Faculty Development Fund, Equipment Replacement Fund and Maintenance Fund • Generation, retention and utilization of revenue generated through variety of activities • Institutions to fill-up all existing teaching and staff vacancies • Delegation of decision making powers to senior functionaries with accountability • Improve student performance evaluation • Improvement of performance appraisal of faculty by students • Provide faculty incentive for Continuing Education (CE), consultancy and R&D • Obtaining accreditation	**Yes**	**Yes**
2	Availability of academic autonomy as recognized by UGC for both UG and PG programmes	Yes	**Yes**
3	Presence of Board of Governors with an eminent academician or industrialist as the Chairperson	Yes	**Yes**
4	Percentage of eligible UG programmes accredited or applied for	60%	**100%**
5	Percentage of eligible PG programmes accredited or applied for	40%	**100%**
6	Cumulative number of PhDs produced in the last three academic years (2007-08, 2008-09, 2009-10) Or	5	**11**
	Cumulative number of MTech produced in the last three academic years (2007-08, 2008-09, 2009-10)	50	**71**
7	Faculty positions filled on regular full time basis as percentage of total faculty positions sanctioned in accordance with the AICTE prescribed student to faculty ratio**#**	65%	**100%**
8	Percentage of regular faculty with PhD in engineering as percentage of total faculty	15%	**16.81%*** **18.75%**^ **21.98%**$

This is achieved by recruitment of faculty at the beginning of every academic year

*Percentage of engineering faculty with Ph.D to total faculty (39/232)

^Percentage of engineering faculty with Ph.D to total engineering faculty (39/208)

2. INSTITUTIONAL DEVELOPMENT PROPOSAL (IDP)

2.1 Give the executive summary of the IDP (maximum ½ page)

Siddaganga Institute of Technology (SIT) was established in the year 1963. SIT was one among the 14 technical institutions from the state of Karnataka to have participated in TEQIP-I. Activities initiated and carried out under TEQIP Phase-I have added good infrastructure and provided better training for faculty and staff. The institute was granted academic autonomy in the year 2007.

With better infrastructure and high-quality faculty, the Institute is now geared up to achieve enhanced growth by scaling up research and development activities and closer interactions with industry. In this backdrop, the current proposal is submitted for TEQIP-II. The Institute has entered into MoU with ten institutes of higher learning such as University of Memphis (USA); RMIT (Australia), IIIT-B, Bangalore; Vellore Institute of Technology, Vellore; NIT-K, Surathkal; and University of Agricultural Sciences, Dharwad etc. Similarly 40 MoUs are signed with industrial units, out of which 7 are Multi-National Corporations. These MoUs are meant for various activities ranging from faculty and student training to collaborative research product development and consultancy. To cater to the local needs, we have entered into MoUs with local industries and the Irrigation Department.

The proposal focuses on three major aspects of growth in future: (a) strengthening post-graduate education; (b) enhancing demand driven research and (c) increased interactions with industry. In order to get clarity on future action plan and to set realistic targets, a SWOT analysis was carried out at each department involving all stakeholders. Subsequently, a detailed strategic plan was drawn based on the inputs from SWOT analysis. The plan for the next four years concentrates on (a) enhanced faculty and staff development; (b) enhanced research and development; (c) enhancing industry-institute interaction; (d) collaboration with institutes of higher learning and peers from reputed institutes; (e) strengthening the existing PG programmes and starting new PG programmes in 7 different areas; and starting Ph.D. programmes in three engineering departments (f) offering consultancy services and training programmes; (g) strengthening laboratories for offering PG programmes and advanced research; (h) strengthening learning resources and knowledge inventory; (i) establishing bio-technology finishing school; (j) establishing center of excellence in Nano-technology and (k) establishing a finishing school for academically weak students.

Training Need Analysis carried out in each department has helped in identifying the areas of training requirements. Strategies for scaling up enrollment to PG and doctoral programmes have been chalked out. Steps are taken for enhancing Industry-Institute interactions in terms of industry research, Joint M.Tech. guidance, industry electives, curriculum development. Action plan is drawn for innovation, product development and commercialization. The proposal for starting Bio-technology Finishing School is already submitted. It is also proposed to start centers of excellence in association with IBM and National Instruments. The institute is fully committed to implement various reforms. Sustainability plans for carrying out the activities beyond the project period are already drawn. Detailed time-bound action plans have been prepared for achieving the objectives stated in the plan and realistic targets have been fixed in each area. Based on this, publication of 61 papers and 22 patents are planned during the next four years. It is planned to start 7 new PG programmes and the strength of PG students is expected to double in 2 years and enrollment to Ph.D. will also increase significantly. The fund requirements for various activities are estimated at Rs.

4.00 Crores. The break up of fund requirements on an annual basis is given below.

2010-11	2011-12	2012-13	2013-14
		2.00	**2.00**

By pursuing the above objectives, SIT plans to become a leading institution, most sought after for PG education and full time doctoral studies; a source for high quality technical manpower; engaged in high quality research and consultancy in the cutting-edge areas of technology by the end of TEQIP-II.

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

SWOT Analysis

Internal Environment			
Strengths		**Weaknesses**	
S-1	**Academic autonomy** helping in designing new course, industry-oriented curriculum, and innovative teaching-learning practices	W-1	Limited **Industry-Institute Interaction** and industry exposure to faculty is limited in many departments
S-2	Excellent **infrastructure** comprising well-furnished class rooms, faculty chambers, student hostels, sports and recreation facilities etc.	W-2	Insufficient number of **latest books and journals** in the library for PG level education & advanced research
S-3	Full fledged **placement cell** headed by a senior professor, which continuously interacts with various industries	W-3	Poor **campus placement for PG students** and inability to place students in core industries in certain branches like Electrical, Instrumentation, Mechanical etc
S-4	**Central library** comprising of 90,000 volumes, 20,000 titles and 150 journals (national and international)	W-4	Insufficient **funded/sponsored** research/consultancy projects
S-5	Excellent **computing facilities** (each faculty provided with desktops) and campus wide networking (Wi-Fi) with 10 mbps leased line	W-5	Lack of **faculty expertise** in certain areas like Communication Research, Structures (for offering PG) etc
S-6	Very good **brand image** attracting students with high ranks in entrance exams	W-6	**Inadequate training** to faculty members in areas like advanced research methodology, advanced materials characterization, rapid prototyping, CFD etc
S-7	Strong **alumni base** spread all over the world, working in reputed organizations and institutions	W-7	Non-availability of **laboratories for PG and research** in advanced areas like image processing, data mining, warehousing, on-line instrumentation & data logging, materials & thermal engineering
S-8	9 departments recognized as **research centre** for offering Ph.D. by VTU.	W-8	Teaching pedagogy predominantly comprises of lecture method and inadequate training to faculty in **alternative pedagogical tools**
S-9	Strong faculty base with **51 Ph.D. holders and 45 pursuing Ph.D**.	W-9	Non-availability of certain **advanced software** and learning aids like

Internal Environment			
Strengths		**Weaknesses**	
	degree, from reputed institutes like IITs, IISc, NITs etc		Aspen, Fluent etc
S-10	**Research expertise** in the fields of Geotechnical engineering & Hydraulics (Civil Dept.); Virtual Instrumentation, Embedded systems, Thin film sensors, Electrical contacts, control systems & VLSI designs. (Instrumentation Dept.); Materials technology& thermal engineering (Mechanical Dept.); Signal Processing (E& C Dept); Cryptography and network security (Computer Science Dept.); Image processing, chiral silicon carbide materials and microwave antennas (Telecommunication Dept.)	W-10	**Faculty attrition** in few departments like Computer Science, Information Science etc
S-11	Excellent **laboratory facilities**, especially in the fields of thin film-sensors (Instrumentation Dept); soil dynamics (Civil dept); IC engine, material sciences (Mechanical Dept); and cryptography (Computer Science Dept)	W-11	Automation of the central library and administrative departments is in progress.
S-12	Institute has **10 MoUs with institutes of higher learning** like University of Memphis (USA); RMIT (Australia), IIT-B, VIT, NIT-K and University of Agricultural Sciences, Dharwad.	W-12	The transition rate of SC students is poor
S-13	Institute has **40 MoUs with industrial units** like Syscon (Japanese MNC), Infosys, EMC^2, TCS, National Instruments, UltraTech Cements etc.	W-13	Lack of barrier free access and amenities for physically challenged.
S-14	Good number of **publications** by faculty in national and international journals		
S-15	The only institute to offer **a unique PG programme** in Signal Processing in the state		
S-16	**Consultancy services** offered in the areas of soil/concrete testing (civil dept); testing facilities in the areas of induction motors and transformer oil (electrical dept)		
S-17	**Nine funded projects** worth **Rs.141.15 lakhs** are ongoing and proposals for **20** more projects worth **Rs.304.03 lakhs** are submitted to various funding agencies like DST, GTRE, AICTE, CABS, VTU etc.		
S-18	For the last 17 years, two **workshops of one week duration** are being conducted every year in each department for content up-gradation of faculty in the latest developments in the respective fields.		
S-19	**Six exclusive R&D laboratories**		

Internal Environment			
Strengths		**Weaknesses**	
	set up under TEQIP Phase I in various departments		
S-20	Facilities are being set up for research in the area of **Nano-Technology**; a clean room is created and many faculty members are working for their Ph.D. degree in the area of nano-technology		

External Environment			
Opportunities		**Threats**	
O-1	**Proximity** to Bangalore provides ample scope for industry linked activities in the fields of information technology, bio-technology etc	T-1	Increased **competition** from existing as well as new institutes including foreign universities
O-2	Growing **demand for qualified manpower** in the fields of transportation and infrastructure; VLSI design and embedded systems; process automation; network and cryptography; bio-technology etc. providing employment opportunities for students	T-2	**Faculty migration** across institutes in certain areas like Computer Science, Electronics & Communication, Information Science etc
O-3	**Increased demand** for post graduates in the areas of Computer Integrated Manufacturing, Information Management & Retrieval, Information Security, Manufacturing & Design, VLSI design and Embedded Systems etc. providing scope for starting PG Programmes	T-3	**Fast changing technology** leading to obsolescence of curriculum, especially in areas like Computer Science, Electronics & Communication, Information Science, Telecommunication, Instrumentation etc
O-4	Scope for designing and offering **training programmes** for industry personnel in the cutting-edge areas like quality management, materials management, lien manufacturing, simulation in manufacturing, networking, information storage & management, DB2, AJAX, cloud computing, mobile computing, virtual instrumentation, process automation, CNC machines, bio-diesel extraction etc	T-4	**Non-availability of faculty** with Ph.D. degree in areas like Software Engineering, Data warehousing & database securities, CFD, RPT, Pharmaceutical bio-technology, Clinical research and data management etc
O-5	Scope for starting **Bio-Technology finishing school**	T-5	Majority of the graduate students getting placed in IT related companies resulting in **poor quality of intake** for PG programmes
O-6	Opportunity for **sponsored/funded projects** from various agencies like AICTE, BRNS, DST, VTU, ISRO, CPRI, National Solar Mission etc. in various areas of technology	T-6	Bio-technology graduates facing competition from **basic science** graduates and post graduates from related fields.
O-7	Possibility of offering **multi-disciplinary consultancy** services for small and medium enterprises in an around Tumkur		
O-8	**Collaboration** with institutes of higher learning like IISc, IITs etc for joint research in various areas of		

External Environment			
Opportunities		Threats	
	technology		
O-9	Scope for **promoting research** in the fields of Supply Chain Management, Quality Engineering, Multi-core Architecture, Thin film Sensors, Electrical contacts etc		
O-10	Scope for **development of technology/products** in the areas of VLSI, bio-metric authentication, security & surveillance, wireless micro-wave communication, satellite communication, thin film sensors etc		

Immediate priorities based on SWOT:

a) Strengthening the industry-institute interactions
b) Faculty training in pedagogy, effective PG teaching and research.
c) Enhancing research activities through independent as well as funded/sponsored research projects
d) Making the PG programmes more industry oriented and improving the placements of PG students
e) Providing support for academically weak students

Conclusions derived: The SWOT Analysis provided an excellent opportunity for introspection. It helped in identifying major strengths like quality of faculty, infrastructure, research expertise in certain areas etc.; and major weaknesses like lack of interactions with industry, lack of expertise and training in certain areas etc. It also helped as an eye-opener towards various opportunities and threats posed by the external environment. This exercise has brought seriousness among various stakeholders towards the need for a proper strategic plan for future growth of the Institute.

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

Institutional Objectives:

a) To be the most sought after Institute for high quality technical education from under-graduate to doctoral level.
b) To be a centre of advanced research in cutting-edge technologies
c) To be an incubation centre for development of commercially viable new products and technologies.
d) To be a leading centre for providing industrial consultancy, training programmes and technology transfer.
e) To contribute towards the development of society at large by utilizing the intellectual capital.
f) To be a responsible social entity by being environmental friendly in all activities.

Based on SWOT, the strategic objectives developed for the Institution are as follows:

1. Enhanced faculty and staff development
2. Enhanced research and developments and starting doctoral programmes in 3 more engineering departments
3. Enhancing Industry-Institute Interaction.
4. Collaboration with institutes of higher learning and peers from reputed institutes.

5. Strengthening the existing PG programmes and starting new PG programmes in 7 different areas.
6. Offering consultancy services and training programmes
7. Strengthening laboratories for offering PG programmes and advanced research.
8. Strengthening learning resources and knowledge inventory
9. Establishing Biotechnology finishing school with support from Govt. of Karnataka
10. Establishing center of excellence in Nano-Technology
11. Establishing a finishing school for academically weak students

- **Show how the results of SWOT analysis are linked to the key activities proposed in the proposal.**

#	Outcome of SWOT	Key activities proposed
1	Enhanced faculty and staff development	• Training in pedagogy and management capacity development • Training in content up-gradation (both in-house and outside) • Faculty deputation for Ph.D. programme and higher studies. • Encouraging and sponsoring faculty for workshops and conferences • Providing training to technical, support and administrative staff in selected areas (both in-house and outside)
2	Enhanced research and developments and starting doctoral programmes in 3 more engineering departments	• Identifying various thrust areas of research and funding agencies. • Encouraging faculty to identify their research areas • Encouraging joint research in inter-disciplinary areas. • Submitting proposals for funded projects • Involving PG/UG students in research projects.
3	Enhancing Industry Institute Interaction	• Constitution of Industry-Institute Interaction Cell at each department • Involvement of industry representatives in BoS for curriculum development. • Entering into MoUs with industries for sponsored research, faculty deputation, student projects, technology and product development etc. • Exploring possibilities of offering joint courses (electives) with the support from industry. • Deputing faculty to various industrial units for enhanced exposure. • Involving industry representatives in providing placement oriented training to students
4	Collaboration with institutes of higher learning and peers from reputed institutes	• Encouraging faculty to explore possibilities of joint research with institutes like IITs, IISc, NITs, VIT, IIITs etc. • Exploring possibilities of submitting joint proposal for funded projects in collaboration with professors of institutes of higher learning. • Exploring possibilities of collaborative work towards technology development/product development in various areas. • Entering into agreements for sharing of facilities like advanced research labs, software etc.

#	Outcome of SWOT	Key activities proposed
5	Strengthening the existing PG programmes and starting new PG programmes in 7 different areas	• Submitting proposal for approval of new PG programmes to the regulatory bodies • Constitution of BoS with industry representatives as members. • Identifying faculty for teaching various subjects and recruiting new faculty if required. • Strengthening PG labs with latest software in the identified areas • Strengthening libraries and subscription to more e-journals • Providing scholarships to meritorious students • Offering variety of industry oriented electives in various areas • Exploring possibilities of offering joint courses (electives) with the support from industry • Encouraging and assisting students in taking up live projects sponsored by industry • Establishing contacts with core industries for better campus placement of PG students.
6	Offering consultancy services and training programmes	• Constitution of consultancy cell in departments where facilities exist. • Identification of areas for providing consultancy services and training for industrial units in and around Tumkur • Associating with local industrial representative bodies like TuMA, FKCCI and govt. agencies for getting consultancy projects/training programmes. • Preparation of information brochures giving details of facilities available for testing and other services and distribution of the same to industrial units. • Deputation of faculty members to leading consulting firms for exposure and training in consulting. • Encouraging faculty to design training programmes for industry personnel in their areas of expertise. • Taking necessary steps for getting certain departments recognized by appropriate authorities as testing centres.
7	Strengthening laboratories for offering PG programmes and advanced research	• Identification of facilities/equipments required in various laboratories • Procurement of new equipment and software. • Providing training to faculty and non-teaching staff in the new labs
8	Strengthening learning resources and knowledge inventory	• Procurement of latest books in the areas of specialisation • Subscription to advanced journals (including e-journals)
9	Establishing Biotechnology finishing school with support from Govt. of Karnataka	• Submitted proposal to Govt. of Karnataka • Have MoUs with BT industries • Recruitment of faculty • Developing necessary infrastructure • Starting the centre
10	Establishing center of excellence in Nano-Technology	A detailed action plan would be furnished later
11	Establishing a finishing	• Formation of a core committee

#	Outcome of SWOT	Key activities proposed
	school for academically weak students	• Identification of academically weak students • Conducting remedial teaching and special tutorials • Conducting soft-skill training • Conducting high-intensity training for unemployed graduates and facilitating placements

2.3 State the specific objectives and expected results of your proposal in terms of, "Scaling up Postgraduate Education and demand driven Research & Development and Innovation". These objectives and results should be linked to the SWOT analysis.

General Objectives:

1. Scaling up Post Graduate education
2. Faculty and staff development
3. Increased interaction with industry
4. Enhancing demand driven R&D and consultancy
5. Additions to infrastructure and learning resources
6. Implementation of reforms
7. Academic support to weak students

Specific Objectives:

1. Enhanced faculty and staff development
2. Enhanced research and developments and starting doctoral programmes in 3 more engineering departments.
3. Enhancing Industry Institute Interaction.
4. Collaboration with institutes of higher learning and peers from reputed institutes.
5. Strengthening the existing PG programmes and starting new PG programmes in 7 different areas.
6. Offering consultancy services and training programmes
7. Strengthening laboratories for offering PG programmes and advanced research.
8. Strengthening learning resources and knowledge inventory
9. Establishing Biotechnology finishing school with support from Govt. of Karnataka
10. Establishing center of excellence in Nano-Technology
11. Establishing a finishing school for academically weak students

Objectives of IDP related to SWOT

#	Objectives of IDP	Outcomes	Linkages with SWOT
1	Enhanced faculty and staff development	• Improved technical competence • Improved teaching-learning process • Improved quality of graduates • Increased visibility and reputation of the institute	S9, S18 W1, W6, W8 T4
2	Enhanced research and developments	• Improved research culture at the institute • Increased exposure to faculty in latest areas of research • Increased enrolment for Ph.D. • Improvement in publications by faculty • Increased visibility and reputation of the institute	S8, S9, S11, S12, S17, S19 W4 O6 T4
3	Enhancing Industry Institute Interaction	• Increased industry exposure to faculty • Better placement for students • Industry relevant curriculum • Increase in enrolment to PG programmes	S4, S9, S11, S13 W1, W3, W4 O1, O10 T3
4	Collaboration with institutes of higher learning	• Increased exposure to faculty in latest areas of research • Inputs for development of internal facilities	S9, S12 W4 O8

#	Objectives of IDP	Outcomes	Linkages with SWOT
	and peers from reputed institutes	• Increased publications • Increased visibility and reputation of the institute	T4
5	Strengthening the existing PG programmes and starting new PG programmes in 7 different areas	• Improved curriculum • Increased industry orientation to students • Better placement possibilities for students • Increased quality and quantity of admissions to PG • Increased placements for PG students • Increased faculty expertise • Establishment of labs in cutting-edge technology	S1, S7, S9, S13 W7, W9 T1, T7, T9 O1, O2, O3, T3, T5
6	Offering consultancy services and training programmes	• Increased industry exposure to faculty • Increased expertise in selected areas • Usage of real life examples and case studies in teaching • Involvement of students in real life projects • Increased visibility and reputation of the institute	S9, S10, S11, S16, S19 W1, W9 O4, O7, O10 T2, T6
7	Strengthening laboratories for offering PG programmes and advanced research	• Increased quality of PG teaching • More enrolments for Ph.D. degree • Improvement in research in latest areas • Better consultancy services • Exposure to students in latest technology	S8 W7, W9 O6, O7, O10 T3
8	Strengthening learning resources and knowledge inventory	• Increased research ambience and culture • Faculty and students keeping abreast with the latest trends in technology • Generation of new and innovative ideas for research/projects	W2, W5 O6
9	Establishing Biotechnology finishing school with support from Govt. of Karnataka	• Enhanced employability of students • Enhanced interaction with bio-tech companies • Increased exposure to faculty	S1, S6, S9 O5, O2 T6
10	Establishing center of excellence in Nano-Technology	• Enhanced R&D activities and interaction with R&D labs • Increased collaborative activity with industry and institutes • Thematic research in focused areas.	S1, S9, S13 O1, O5
11	Establishing a finishing school for academically weak students	• Increased academic support to weak students • Higher transition rates • Enhanced placements for weak students	W12

2.4 Provide an action plan for scaling up enrollment into Masters and Doctoral programmes (include measures to attract qualified students and maintain high quality standards).

PG Programmes:

At present we have 5 full time and 1 part time PG programmes. It has been planned to start 7 new PG programmes out of which 2 will be started in the academic year 2010-11 and the rest in 2011-12. PG enrolment is expected to double in two years from now. The strength of PG students is expected to be scaled up as follows:

	2009-10	2010-11	2011-12	2012-13	2013-14
Number of PG Programmes	5	7	12	12	12
Number of students	80	112	168	190	190

In order to scale up the enrolment to PG programmes, the following activities are planned:

1. Start 7 new PG programmes in emerging areas (2 in Sept 2010 and the remaining 5 in Sept 2011)

2. Offering Teaching Assistanceship to Non-Gate M.Tech students.
3. Industry interface in the form of involvement of industry representatives (at least two) as members of BoS for developing industry relevant curriculum; experts from industry offering PG courses; industry specific electives; industrial training; projects based on industry research; involvement of industry experts for project evaluation etc.
4. Compulsory publication from the M.Tech thesis to improve the quality of research.
5. Faculty training for effective PG teaching

It is proposed to provide 2 PG scholarships in each of the 12 programs from the academic year 2012-13

Doctoral Programme:

At present we have 6 engineering departments recognized as Research Centers and 41 candidates are currently pursuing Ph.D in engineering discipline. Currently 15 faculty members are guiding Ph.D students. Another 14 faculty members with Ph.D can guide more candidates. Many more faculty members, who are currently pursuing Ph.D would be completing their research shortly, and would become eligible to guide doctoral students. This would result in quantum jump in enrolment of doctoral students. Moreover, faculty members have formed various research groups for submitting proposals to various funding agencies. This would lead to increased research activity and improved infrastructure. The plan for scaling up enrolment to Ph.D is given below.

Branches recognized as R & D centres by VTU, Belgaum	Branches applied for recognition as R&D centre to VTU, Belgaum	Number of faculty with PhD available for guidance	Number of faculty members guiding for PhD as on March 2010	Number of students expected to register for PhD during 2010 to 2012	Number of students expected to register for PhD during 2012 to 2014
06	**03**	**29**	**15**	**20**	**30**

In order to scale up the enrolment to Ph.D programmes, the following activities are planned:

1. Obtain research centre approval for three more departments (IEM, Telecommunication and Information Sciences)
2. Offer research assistanceship to 10 full-time scholars during the project
3. Faculty development linked to research competence.
4. Collaborate with industry for research on real life problems in industry
5. Offer joint Ph.D programmes with industry and other institutions
6. Enhance research infrastructure by subscribing to advanced journals; procurement of relevant software and lab equipments; computational facilities; reprographic facilities etc.
7. Establish linkages with professors of IISc/ IITs/ foreign universities for review of research work and explore possibilities of joint guidance under External Registration Programme of IISc.
8. Enhance research competence by conducting programmes/workshops on research methodology; deputing research scholars to laboratories at institutes of higher learning/CSIR labs/industry labs etc.

Table 1. Budget for providing Teaching and Research assistanceship

	2012-2013	2013-2014
P.G. Enrolment	20.16	27.84
Ph.D. Enrolment	10.8	21.60
Total	**30.96**	**49.44**
Grand Total	**80.40**	

2.5 Provide an action plan for improving collaboration with Industry.

Action Plan for improving collaboration with Industry in the areas of Research:

I. Faculty Research in Collaboration with Industry

Sl No	Topic	Department	Name of Industry	People involved		Timeline
				College	Industry	
1	" Developing testing procedures for various composite materials"	Mechanical Engg	Bangalore Integrated System Solutions Pvt Ltd,	R. Suresh, Assistant Professor, Dept. of Mechanical Engg.	Mr. Ramakrishna Hebbar , Assistant Engineer for Planning.	3 years
2	" Development and design of new bearing materials"	Mechanical Engg	Megamiles Bearing Corporation Pvt Ltd, Bangalore	Dr. G.S. Shivashankar	Expert from Megamiles to be identified	3 Years
3	" Work on Nuclear Power Plant Components and Automobile Industry Automation"	Mechanical Engg	Avasarala Technologies Ltd, Bangalore	Dr. H.R.Purushotham and Dr.B.M.R. Prasanna	Mr. B.M. Renukaprasad.	3 Years
4	"Aromatic compounds (rose crystals) manufacturing"	Chemical Engg	Tadimety Aromatics Pvt Ltd, Hirehalli Industrial Area, Tumkur	Dr. K.L. Shivabasappa	Mr. Mallikarjun.	3 Years
5	Will be explored in consultation with GKVK, Bangalore	Chemical Engg	GKVK, Bangalore	Dr. Nirgunababu. P.	Scientist from GKVK.	3 years
6	Performance Evaluation on Security Algorithms for report generating devices	Computer Science	ABB Global Industries and Services , B'lore	Dr. N.R.Sunitha	Sri. Sanjeev Kaul, Scientist.	3 Years
7	Optimizing the performance of Air – Conditioning System.	Electronics Engg	ABB Global Industries and Services Limited, Bangalore	T.C. Mahalingesh, Asst. Prof, SIT, Tumkur	Ms. Apala Ray, Research Scientist	1 Year
8	" Signal Processing "	Electronics Engg	LRDE, DRDO, Bangalore	A. N. Mukundarao	Scientist from LRDE	3 Years
9	"Project work on Signal Processing "	Electronics Engg	ISRO Satellite Center, Bangalore.	Dr. K.V. Suresh	Scientist from ISRO	1 Year
10	To be finalised in consultation with TITAN Industries Limited.	Electronics Engg	TITAN Industries, Bangalore	B. Sudarshan	Expert from TITAN Industries	1 Year
11	Project on Computer Aided Manufacturing – Modelling and Simulation	IEM	Government Tool room and Training Center, Bangalore	Dr. R.S. Kadadevaramath	Sri. H.R. Jayadevappa, Managing Director	3 years

12	Process Improvement Study of lean six sigma implementation in Tumkur and Bangalore rural dist. in SMES	IEM	BCG, Bangalore	Dr.G.V.Prabushankar, Dept. of IEM, SIT	Dr.R V Jayathirtha, Director, BCG, Bangalore	3 Years
13	Cement-admixture compatibility	Civil Engg	Ultra Tech Cement, Bangalore	Dr. J. K. Dattatreya S.M.Maheswarappa Siddesh H	Dr. V. Ramachandra, Zonal Head (Tech.), Ultra Tech Cements	3 Years

INNOVATION AND PRODUCT DEVELOPMENT

To encourage faculty and students to take up projects leading to new products services and patents, the following plan is proposed department wise:

Sl.No	Department	No. of new products/services/patents	Budget In Rs.
1.	Civil	02	20,000-00
2	Mechanical	02	20,000-00
3	Electrical and Electronics	02	20,000-00
4	Electronics and Communications	02	20,000-00
5	Computer Science and Engg.	02	20,000-00
6	Information Science and Engg.	02	20,000-00
7	Telecommunication Engg.	02	20,000-00
8	Chemical Engg.	02	20,000-00
9	Industrial Engg. and Management	02	20,000-00
10	Instrumentation Technology	02	20,000-00
11	Bio Technology	02	20,000-00
		22	2,20,000-00

Action Plan for Consultancy

Department of Civil Engineering

i) The dept of Civil Engineering is engaged in consultancy activities related to Structural engineering and Geotechnical engineering.

ii) The clients include various Govt. departments, Private sector agencies and Industry in and around Tumkur. The Geotechnical Group has carried out consultancy work worth Rs. 15 lakhs in the past two years.

iii) The department has MoU with Elite Engineering & Consultancy Services, Bangalore, for consultancy related activities.

Plan of action for other departments to start consultancy activities

i) Survey of the consultancy requirements of local industry will be undertaken
ii) A brochure containing the state-of-the-art equipment, faculty expertise, will be prepared and circulated and wide publicity will be given.
iii) Faculty and staff will be trained for taking up consultancy activities
iv) A compendium of abstract by faculty is sent to various Industries as detailed in which leads to some opening in consultancy assignments [ABB]
vi) It is proposed to obtain NABL and ISO Certification for identified laboratories for enhancing the consultancy activities.

Table 2 : Total Budget for Industry Institute Interaction activities

	Activities	2013	2014	Total
Industry Institute Interactions	Collaborative academic programs: BTech/MTech/PhD with industry	0.56	0.70	1.26
	Short term workshops with industry	1.38	6.70	8.08
	Academic networking with industry/research institutions including industry-exposure to teachers and students	1.14	2.20	3.34
	Campus placements of graduates (UG & PG)	1.75	0.30	2.05
	Students internship at industry	0.00	1.00	1.00
	Joint activities with industry	0.00	2.06	2.06
	Others	4.84	0.00	4.84
	Sub-total	3.50	12.96	16.46

2.6 Provide an action plan for :

- Quantitatively increasing and qualitatively improving research by their faculty individually, jointly and collaboratively,
- Developing research interest among undergraduate students, and
- Collaborating with Indian and foreign institutions in academic and research area through MoUs

R&D Action Plan for 2010-2014

1. Quantitatively Increasing and Qualitatively Improving Research by Faculty Individually, Jointly and Collaboratively

Research activities are the integral part of the ongoing activities of the faculty in the institute. Nine departments in the institute have been recognized as R&D centres (Dept of Civil Engineering, Mechanical Engineering, Electronics & Communication Engineering, Chemical Engineering, Instrumentation Technology, Computer Science & Engineering, Physics, Chemistry & Mathematics) by the Visvesvaraya Technological University (VTU), Belgaum. An application for recognition of the department of IEM as research centre from the academic year 2010-11 was submitted to VTU. An expert committee visited the department and the approval from the university is awaited. Two departments (Dept. of Telecommunication Engineering and Information Science & Engineering) are in the process of applying to VTU, Belgaum for recognition as R&D centres. Around 48 faculty members of various departments have obtained PhD from various renowned institutions like IISc, IITs, NITs & VTU and another 45 faculty members are pursuing their PhD in these renowned institutions. All the faculty with PhD are actively involved in the research activities and are guiding a number of students for their PhD in various research areas.

Faculties have formed various collaborative research groups to carry out research such as:

I. Collaborative Research with University Colleges
II. Collaborative Research with NITs
III. Collaborative Research with IITs

IV. Collaborative Research with IISc
V. Collaborative Research with CSIR labs
VI. Collaborative Research with foreign universities
VII. Interdisciplinary collaborative research activities within the institute
VIII. Individual faculty research

The details of faculty forming these various research groups, collaborative faculty from other institutions, timeline, future plan and outputs of the projects are enclosed in the following pages.

- To improve the research activities both qualitatively and quantitatively, the MoUs have been signed between SIT and various renowned institutions like NITK Surathkal, VIT Vellore, GTTC Bangalore, IIIT Bangalore and Agricultural University Dharwad, etc. MoUs are also signed between various departments of SIT and renowned industries

- Nine research projects have been funded by various funding organizations like DST, AICTE, DRDO etc. Faculties have submitted another twenty research project proposals to various funding agencies which are at various processing stages and are expected to be funded between 2010 & 2014. Faculty is encouraged to submit research proposals to various funding agencies by granting an incentive of one percent of the total fund sponsored to the project.

- As on March 2010, there were 130 research publications in the refereed international journals. To encourage faculty to publish research papers in the international journals an incentive/award of Rs.4000/- (Rs. Four Thousand only) per paper published is being given.

- As on March 2010, there were 29 research publications in the refereed national journals. Faculties are encouraged to publish research papers in National journals by providing an incentive of 2000/-(Rs. Two thousand only) per paper published.

- Research paper presentations by faculty in various conferences in India & Abroad are encouraged by providing registration fee, TA and DA.

- Faculties are encouraged to write text books. For each book published an incentive of Rs.5000/- is awarded for the faculty member.

Details of Ph.D students and Eligible Guides in various departments and the action plan to improve the enrolment

- Nine of our departments are recognized by VTU as research centres leading to Ph.D. At present, there are 44 candidates pursuing Ph.D. on part-time basis in these centres, under the guidance of 19 faculty members. These faculty members have obtained their Ph.D. from renowned institutes such as IISc, IITM, IITKG, PSG-Coimbatore and VTU Belgaum.

The following measures are planned to increase registration of students to Ph.D:

1) Research assistanceship for full time scholars every year – Ten Scholars

2) Provision for in-house faculty to register as full time candidates.
3) To meet the research requirements in terms of necessary state of the art equipment and software.
4) To subscribe to journals and strengthen library facilities.
5) To facilitate industry interaction of eligible guides so that industry problems can be pursued for research as this will increase the visibility of the institute in the industry sector.
6) To encourage joint guidance with industry experts wherever possible.
7) To provide full freedom for research scholars similar to what prevails at IISc and IITs.
8) Depute research scholars (attachment training) to laboratories at institutes of higher learning (IISc or IITs) or Industry R&D Labs to facilitate research work.
9) To provide benefits such as deputation to national and international conferences in India and abroad.
10) To arrange research orientation programme for fresh registrants where research article writing skills, access to online journals and expertise in using software located on the central servers.
11) Establish linkages with Professors of IISc and IITs for review of research and comments.
12) To provide computational facilities, stationery, reprographic facilities.
13) For those deprived of research assistanceship, provision will be made to offer teaching assistanceship and involvement in consultancy assignments wherever possible.

R & D Projects under TEQIP Phase-II

I. Collaborative Research with University Colleges

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. Nandeesh Dr.V. Udaya Kumar H.D. Sharma	Civil Chemistry Civil	Developing a water quality index map for Pavagada taluk of Tumkur district, Karnataka using GIS and remote sensing based on hydrogeochemistry	TARGET: • **Chemical Analysis will be completed by JAN 2014.** • **Index map will be ready by March 2014.** • **One National Journal paper will be communicated by March 2014.**
2.	Dr. S.V. Dinesh Dr. T. Gangadharaiah	Civil Civil	Erosion of clay beds	TARGET: • One International Journal paper will be communicated by June 2014. • One more International Journal paper will be communicated by Dec 2014.
3.	Dr. G.V. Prabhushankar Smt. T.R. Veena	IEM IEM	Design of integrated Lean Six Sigma Quality Management System	TARGET: • One International Journal paper will be communicated by March 2014.
4.	Dr. R.S. Kadadevaramath Smt. Latha Shankar	IEM IEM	Supply chain network Architecture optimization using heuristic approaches	TARGET: • One Ph.D work will be completed by Dec 2013.
5	Dr. P. Usha	Maths	Results on graph valued functions and Results on domination Number of Graphs	TARGET: • One International Journal paper will be communicated by March 2014.
6	Dr. B.S. Gowrishankar Dr.Thomas Theodore Dr.T.Panda (IITM)	Biotech Chemical	Studies on Stability and application of Esterases over pesticides.	TARGET: • One International Journal paper will be communicated by March 2014.
7	C Anupama D.R. Prasanna	Biotech Biotech	Screening of Secondary metabolites having hepato protective activity from different Indian medicinal Plants.	TARGET: • One National Journal paper will be communicated by March 2014

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
8	Dr.S.V.Dinesh Prof.J K Dattatreya B.G. Shivaprakash Dr.L Govinda Raju (UVCE,Blr) Dr.K.Chetan (UVCE,Blr)	Civil	Application of micro tremor studies for Seismic response of infrastructure.	TARGET: • One International Journal paper will be communicated by Aug 2014.
9	Dr.R. Kumaraswamy	E&C	Speaker recognition in uncontrolled environment.	TARGET: • One International Journal paper will be communicated by Feb 2014. • One Ph.D work will be completed by June 2014.
10	Dr. K.V. Suresh	E&C	Image Restoration	TARGET: • One International Journal paper will be communicated by Dec 2013. • One Ph.D work will be completed by Dec 2014.
11	Dr.B.Satish Babu Dr.R.Sumathi	CSE	Trust-based Security System for Ubiquitous Networks.	TARGET: • One International Journal paper will be communicated by March 2014.
12	Manjunath Dammalli K.B.Roopa	Biotech	Identification of lead compound against NF-kB of u.colities .	TARGET: • One International Journal paper will be communicated by Feb2014.

II. Collaborative Research with NITs

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. N.R.Sunitha	CSE	Digital Signatures	• Research work completed. • Four International Journal papers published in 2011-12.

III. Collaborative Research with IITs

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. R. Kumaraswamy	E & C	Development of prosodically guided phonetic engine.	TARGET: • **One International journal paper will be communicated by June 2014.**

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
2.	Dr. K. Vishwanath	TC	Image Transcoding in the Transform domain, image Analysis for Preservation and archiving	TARGET: • One International journal paper will be communicated by Dec 2014. • One national journal paper will be communicated by Dec 2014. • Two M.Tech projects - completed by Dec 2014.
3.	Dr. H.S. Jayanna	ISE	Design And Development of multilingual speaker recognition system with the constraint of limited Data.	• **Work completed.** • **Project Sponsored by VTU, Belgaum** (Rs.5.82 Lakhs) • **Two International Journal papers in 2013.**
4.	Dr. U.S. Mallikarjun	MED	Synthesis & Characterization of Copper Based Shape Memory Alloys	TARGET: • Project will be completed by Dec 2013. • Two M.Tech projects will be completed. • Two International journal papers will be communicated by Dec 2013.
5.	Dr. K.V. Sreenivasa Rao	MED	Single Crystals Growth	TARGET: • One M.Tech project will be completed. • One International journal papers will be communicated by Feb 2014.
	Dr. Virupaxi Auradi	MED		
	Dr. B.Vasudeva	MED		
6.	Dr. K.V. Sreenivasa Rao	MED	Development of 3 D Inverse heat conduction Model (IHCP) – FEM code	TARGET: • One M.Tech project will be completed. • One International journal papers will be communicated by Feb 2014.
7.	Dr.Jagdish P.Ganjigatti	IEM	Manufacturing Simulations And Modeling Using Soft Computing	TARGET: • Two international journal papers will be communicated in Dec 2013.
8.	Dr. S.V.Dinesh (Collabration with IIT H)	Civil	Resilient Modulus studies of pavement materials	TARGET: • **One International journal paper will be communicated by Dec 2013.**

IV. Collaborative Research with IISc

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. S.V.Dinesh	Civil	a)Evaluation of Liquefaction potential and post liquefaction behaviour of soils	TARGET: • Two international journal papers will be communicated in June 2014. • One more student will complete Ph.D by 2015. (ERP Scheme at IISC).
2.	Dr. S.V.Dinesh Dr.T.S. Umesha H.D. Sharma	Civil Civil Civil	Problematic and contaminated soils	TARGET: • One international journal paper will be communicated in Dec 2013. • One student will complete M.Sc (Engg.) in this area by June 2015. • One national journal paper will be communicated in Dec 2014.
3.	Dr. B. Sathish Babu	CSE	Developing Cognitive Agents based trust models for mobile applications	TARGET: • One international journal paper will be communicated by June 2014.
4.	Dr. S.V.Dinesh Dr.Anbazaghan (IISC, Bangalore) B.G.Shivaprakash	Civil	Ground Response Analysis of Deep Soil Deposits and seismic vulnerability assessment	TARGET: • One international journal paper will be communicated in June 2014.

V. Collaborative Research with CSIR labs

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. K.V. Sreenivasa Rao Dr. U.S. Mallik	MED MED	Design and Fabrication of Superconducting fly wheel energy storage system	TARGET: • Two international journal papers will be communicated in June 2014.
2.	Dr. K.V. Sreenivasa Rao Dr. Virupaxi Auradi	MED MED	Synthesis and characterization of Metal Foams	TARGET: • **Research proposal will be submitted to DRDO, Hyderabad** • One student will pursue Ph.D. in this area.

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
				• One international journal paper will be communicated in June 2014.
3.	Dr. U.S. Mallikarjun	MED	Corrosion Studies on Turbine Blade Materials	TARGET: • **Project work will be completed by Dec 2013.** • One international journal paper will be communicated in March 2014.
4.	Dr. K.V. Sreenivasa Rao	MED	Experimental study on the performance of heat pump system with transcritical CO_2 refrigerant	TARGET: • One student will complete Ph.D in this area by 2015. • Two international journal papers will be communicated in Dec 2014.
5.	Dr.Siddeswara prasad. Latha H K E A.Uday Kumar(NAL)	I T	Synthesis and Characterization 3C SiC thin films for sensor applications.	TARGET: • **Two international journal papers will be published by Dec 2013.**
6.	Dr.J.P Ganjigatti Bhanu Prakash Prashanth.P	IEM	Modeling and Analysis of Gas turbine blade behavior to predict resonance amplitude.	TARGET: • One international journal paper will be communicated by Jan 2014.
7.	Dr.N.R.Sunitha	CSE	Techniques for security on ADHOC networks	TARGET: • One international journal paper will be communicated by March 2014. • One Ph.D. by 2016
8.	Dr.Jayanna H.S	ISE	Performance Evaluation of Open Source ASR Tools with Creation of Speech Corpus for Indian English and Hindi	TARGET: • One international journal paper will be communicated by Dec 2013.

VI. Collaborative Research with foreign universities

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr.B.Sathish Babu	CSE	Adaptive Security Network Scheme	• **Project Completed.** • **Work has been carried out at IISc, Bangalore.**

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
				• Sponsored by UKIERI, UK. • One research paper in International Journal.
2.	Dr. R.S.Kadadevara Math	IEM	Supply Chain Management, Optimization, Evolutionary Algorithms	TARGET: • One Ph.D work will be completed by Dec 2013
3.	Dr.M.A.Jayaram	MCA	Soft Computing Applications in Medical data mining	• Research work completed. • Eight research papers in International Journals. • One student completed Ph.D
	Dr.A.S.Manjunath	CSE		
	Dr. AshaGowda Karegowda	MCA		

VII. Interdisciplinary research

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. G.S.Shiva Shankar	MED	Development of Smart structures using hybrid FRP composites	TARGET: • One international journal paper will be communicated in March 2014.
	Dr. U.S. Mallikarjun	MED		
	Dr. R.S.Kadadevara Math	IEM		
	Smt .B.LathaShankar	IEM		

VIII. Individual research

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1	Sridhara B.A.	E&E	Design of Sub Station grounding System.	TARGET: • One UG Research project will be completed by 2014. • One national journal paper will be communicated in Jan 2014.
2	Dr. K P Shivanand	Civil	Studies on HPC with SFRC	• **Work is in progress.** • **Project sponsored by VTU, Belgaum.** (Rs.6.00 Lakhs).
3	Dr.Shivaprasad V	E&E	Detection of Bus Vulnerability in IEEE/Practical Power system Networks	TARGET: • One national Journal paper will be communicated in March 2014.
4	Dr. H.R. Purushothama	MED	Study of performance of IC Engines by using	TARGET:

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
	H. Manjunath	MED	different alternative fuels.	• One national Journal paper will be communicated in March2014.
	Gautham M.G	MED		
5	Dr. P. Nirguna Babu	Chemical	Production of bio diesel	TARGET:
	Prakash Binnal	Chemical		• One international journal paper will be communicated in Feb 2014.
	Manjunath	Chemical		
6	Dr. K.L. Shivabasappa	Chemical	To study thermo physical properties of binary mixtures	TARGET:
	Vinayak.M. Hegde	Chemical		• One National journal paper will be communicated in Feb 2014.
	Harish Phattepur	Chemical		
	Poornima G Hiremath	Chemical		
7	Dr. R. Suresh	MED	Austempered Ductile Iron	TARGET:
				• One international journal paper will be communicated in Feb 2014.
8	Dr. K.V. Suresh	E&C	Biometric Security Systems	TARGET:
	Dr. R.Kumaraswamy	E&C		• One international journal paper will be communicated in Sept 2013.
9	Dr.S.V.Dinesh Prof. Dattatreya D.Prasad, Intl. Infrastructure Engineers, Bangalore)	Civil	Condition assessment and Health monitoring of Flexible Pavements.	TARGET: • One national journal paper will be communicated in March 2014.
10	Prof. Dattatreya Dr.K.P.Shivananda S M Maheshwarappa S. Suresh G.S.Shashidhara	Civil	Development of Durable structural concretes using marginal materials and alternative binders.	TARGET: • Two national journal papers will be communicated in Dec 2013.
11	Dr.G.S.Shivashankar	MED	Characterization and Machinability study on Nano Boron carbide MMC for high temperature applications.	TARGET: • One international journal paper will be communicated in Jan 2014
12	Dr. Virupaxi Auradi Dr. K.V. Sreenivasa Rao	MED	Preparation and property evaluation of 6061 Al reinforced with Al2o3 and graphite particulate composites.	TARGET: • One international journal paper will be communicated in Jan 2014.
13	Dr.Siddeswara prasad.	IT	Design and Development of thin film strain	TARGET:

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
	H M Kalpana		gauge pressure sensors using INVAR 36 alloy	• **Two international journal papers by Dec 2013.**
14	Dr. R. Suresh	MED	Production and characterization of bio-fuel and blending with diesel.	TARGET: • One international journal and one national journal papers will be communicated in March 2014.
15	Dr. Rashmi	E & E	Development and Characterization of NanoDielectrics for electrical insulation applications.	TARGET: • One international journal will be communicated in Dec2013.
16	Dr.T.Gangadharaiah G.Veerappa Devaru	Civil	Vortex Scour around Piers.	TARGET: • One National journal will be communicated by Dec2013. • One international journal will be communicated by June2014.

IX Industry related projects

Sl. No.	Name of the faculty	Department	Research topic	Deliverables	Remarks
1	D.R. Prasanna Dr.B.S.Gowrishankar Harsha O.B (Genotypic India Pvt. Ltd. Bangalore)	Biotech	SBDD for Neuro generative Parkinsons and Alzimer disease using ethano medicinal plant *Withania somnifera*	TARGET: • One National journal paper will be communicated in Feb 2014.	
2	Dr.J K Dattatreya Sri. S M Maheshwarappa Dr.V.Ramachandra (VP, Ultratech Cements)	Civil	Improvement in Robustness of Blended cement concretes.	TARGET: • Two national journal papers will be communicated in Dec 2013.	
3	Dr.K.V.Suresh Partha Das (R & D Engineer, Fowler Westrup India Ltd. Bangalore)	E & C	Color based classification of Pea Nuts.	TARGET: • One international journal paper will be communicated in Sep 2013.	
4	Dr.K.V.Suresh	E & C	Rice quality analysis using Image	TARGET:	

Sl. No.	Name of the faculty	Department	Research topic	Deliverables	Remarks
	Partha Das (R & D Engineer, Fowler Westrup India Ltd. Bangalore)		processing	• One international journal paper will be communicated in Sep 2013.	
5	Dr.B.Satish Babu Dr.N.R.Sunitha	CSE	Generic key management infrastructure for industrial Automation.	• One international journal paper will be communicated in Sep 2013. • Project funded by ABB, GISL, Bangalore (Rs.7.00lakhs.)	
6	Dr.B.Satish Babu Dr.N.R.Sunitha Dr.R.Aparna Dr.A.S.Poornima Dr.Narasimha Murthy Prof. Mukunda	CSE,EC & TCE	Side-Channel attacks infrastructure framework.	TARGET: • One international journal paper will be communicated by March 2014 • One Patent will be filed by March 2014.	

X.Collaborative Research with University Colleges

Sl. No.	Name of the faculty	Department	Research topic	**Deliverables**
1.	Dr. K.S.Shashi Shekar	Mechanical Engg	Design, Fabrication and Performance evaluation of Nano technology integrated next generation automotive radiator	TARGET: • One M.Tech Project by Dec 2014 • One International journal paper will be communicated by June 2014.
2	Dr. K.S.Shashi Shekar	Mechanical Engg	Study of the Effect of Nano Fluids on the Performance of Photovoltaic/Thermal Hybrid Solar System	TARGET: • One M.Tech Project by Dec 2014 • One International journal paper will be communicated by June 2014.
3	Dr. K.S.Shashi Shekar	Mechanical Engg	Aerodynamic Study and Drag Coefficient Optimization of Passenger vehicle by Experimental and Numerical Analysis	TARGET: • One M.Tech Project by Dec 2014 • One international journal paper by 2014.

XI. Collaborative Research with NITs

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr. H K T Kumar Dr.G Umesh(NITKSurathkal) Dr. V Jayaram (IISc,B'lore)	Physics	Synthesis of Nano fluids by Laser ablation technique and its characterization.	TARGET: • One International journal paper will be communicated by June 2014.

XII. Collaborative Research with CSIR labs

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1.	Dr.Umashankar Dr.Virupaxi Auradi	MED	Studies on Development of 6061 Al alloy reinforced with B4c Particulate Composites for use in small turbofan compressor modules.	• **Work is in progress.** • **Approved by ARDB, New Delhi. (Rs. 9.76 Lakhs)**

XIII. Individual research

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
1	Dr.Veena Karjigi Dr.R.Kumaraswamy	E&C	Automatic Dialog System for Student Performance Enquiry	TARGET: • Database Development will be ready by Dec 2013.. • Setting up of base line system by June 2014. • One national Journal paper will be communicated by Sept2014. • One International Journal paper will be communicated by Sept 2015. • Two M.Tech projects by June 2014 & June 2015.
2	Dr. K P Shivamurthy	E & E	Power Electronics & Drives(Solar Cars, Solar lighting or any industrial drive related problem)	TARGET: • One national Journal paper will be communicated by Dec2014.
3	Dr.Vinayak M Hegde Dr.Thomas Theodore Prof. Harish Phattepur	Chemical	Nano materials-Solar cells	TARGET: • One International Journal paper will be communicated in June 2014. • One M.Tech project by Sept 2014.

Sl. No.	Name of the faculty	Department	Research topic	Deliverables
4	Dr.K.C.Narasimha Murthy	TCE	Design of Analog Circuits Using emerging devices.	TARGET: • One national Journal paper in March 2014.
5	Dr.Y.S.Nijagunarya	CSE	Soft computing	TARGET: • One International Journal paper Dec2014.
6	Dr.M.Siddalinga Prasad	Mathematics	Mathematical Modeling of Air Pollution.	TARGET: • Two international journal papers by Jan 2014.
7	Dr.Basavarj Ittanagi	Mathematics	Minimal And Maximal open sets in topological and fuzzy topological Spaces.	TARGET: • Two International Journal papers by June2014.
7	Dr.H.S.Lalithamba Uma.K	Chemistry	Synthesis of Peptides and Peptidomimetics	TARGET: • One International journal paper by June 2014.
8	Dr.SrikantaSwamy	E & C	Automatic License Plate Recognition system	TARGET: • One international journal paper by Dec 2014.
9	Dr.Shiva Prakash P.H Dr.Gangadharaiah T	Civil	Design of Modified Volute Syphon with moving Vanes	TARGET: • One national journal paper by Dec 2014.
10	Dr.N.M.Thipperudrappa	Civil	Statistical analysis of Rainfall distribution in Karnataka	TARGET: • One national journal paper by March 2014.
11	Dr.Siddagangamma N G	Mathematics	Bio Fluid Mechanics-Analysis of Blood flow through arteries.	TARGET: • One International journal paper by June2014.
12	Dr.S.G.Shashikala	Mathematics	Fluid Mechanics	TARGET: **One International journal papers will be communicated by June2014.**
13	Dr.Manjula G J	Mathematics	Fluid Mechanics	TARGET: **One International journal papers will be communicated by June2014.**
14	Dr.S.R Manohar	Physics	Dipole-moments of few organic fluorescent molecules	TARGET: • One international journal paper will be communicated by June 2014.

Summary of Targets of various R & D Projects under TEQIP Phase-II

Research Group	P.G. Projects	Ph.D.	Publications in International journal			Publications in National journal			Patents
			Dec-13	Mar-14	Jun-14	Dec-13	Mar-14	Jun-14	
Collaborative Research with University Colleges	2	5	2	6	2		2		
Collaborative Research with NITs									
Collaborative Research with IITs	10	3	5	2	1				
Collaborative Research with IISc	2	4	3		2				
Collaborative Research with CSIR labs	10	3	3	3	3				
Collaborative Research with foreign universities									
Interdisciplinary research	1	1		1					
Individual research	15	3	4	5	1	3	6		
Industry related projects	7		2	1		2	1		
Patents/Products									22
Total			19	18	9	5	9	0	
	47	**19**	**47**			**14**			**22**

2. Action Plan for Developing Research interest among Undergraduate Students

- The UG students carry out projects in a batch of 4 in the pre-final year (mini project) and in final year (major project). The expenditure incurred towards many of these projects will be sponsored by the institute and some of the local industries. Students are also encouraged to submit the proposals for funding to KSCST, Bangalore. Usually many projects are sponsored by KSCST.

- To develop research interest among undergraduate students, students were taken to various industries and research organisations to study the recent developments in various areas. This will help the students to explore and implement their ideas to take up various innovative projects.

- Students are motivated to take up projects which address the problems faced by the industries.

- Students are motivated to participate in the various project exhibitions and competitions such as SHASTRA conducted by IITM, BAHA SAE Competition and KSCST exhibition.

- An exhibition of students' projects is organised every year in all the departments internally and in each department three best projects will be selected for awards.

- Students are encouraged to write research papers based on their projects and to publish/present the findings in the research journals/conferences. The registration fees and TA/DA will be given by the institute.

- A provision is made for UG students who have CGPA> 8.5, to carry out research project under the guidance of a faculty member with Ph. D. In lieu of One open elective and One Humanity subject. The research will be for a period of one year. This will be evaluated by an external examiner at the end of one year. Publications are also used as criteria for the evaluation.

- The Key activities are
    - To provide seed grants for research by faculty
    - To organize conference/seminars/workshops in research topics.
    - To encourage faculty to publish their research work in reputed journals and conferences.
    - To depute faculty members to conferences which will be held in India and Abroad.
    - To encourage Patenting of ideas/products and to go for commercialization wherever possible.

Table 3 : Total Budget for R & D activities

	Activities	2013	2014	Total
R&D	Research projects taken by UG /PG students	1.72	3.80	5.52
	Seed grants for research by faculty	0.00	6.10	6.10
	Research publications in engineering in refereed journals	0.08	1.15	1.23
	Organising conferences on R&D topics	11.30	6.40	17.70
	Patenting of technologies	0.94	1.27	2.21
	Others	0.00	0.00	0.00
	Sub-total	14.04	18.72	32.76

3. Collaboration with Indian and foreign institutions in academic and research area through MoUs

To improve the research activities both qualitatively and quantitatively, a number of MoUs have been signed between SIT and various renowned Indian and foreign institutions and industries. The MoUs were signed with a view to network with each other for mutual benefit. The various areas identified to work jointly are:

1. Faculty training in identified areas
2. Student exchange for one or two semesters with credit recognition
3. Joint continuing education program
4. Joint faculty development workshops
5. Submission of joint research proposals to funding agencies
6. Joint publication in selected areas
7. Preparation of learning materials
8. Utilization of lab facilities by the faculty from networking institution
9. Collaboration for student projects
10. Joint guidance leading to M.Tech./Ph.D

The following have signed MoUs with SIT to carry out collaborative research institutions.

i. VIT University, Vellore

SIT, Tumkur will collaborate with VIT, Vellore in the following areas for academic & research activities. Research activity will be carried out in the following areas

- Signal Processing
- Thin film / Nano technology
- Chemical Engineering
- Renewable energy sources
- Materials and its characterization
- Corrosion of materials
- Network security
- Computer algorithms

In the above areas, collaborative research work between the faculty of both Institutions have been broadly identified, the details of which are given in the proceedings of the meeting held at VIT, Vellore on 3rd August 2010. The above collaborative research work will lead to joint publications. Also, faculty training in identified areas and joint continuing education programs would be organized. In addition, utilization of lab facility execution of students' projects will also be carried out for mutual benefits

ii. National Institute of Technology Karnataka [NITK], Surathkal

SIT and NITK will collaborate in research activities in the following areas:

- Applied Mechanics Department
    - Applications of Remote Sensing and GIS
    - Satellite Data Processing
    - Hydrology and Water Resources
    - Scour around bridge piers
- Mechanical Engineering Department
    - Preparation of FRP and Smart structures
    - Synthesis and characterization of Smart Materials
    - Structure Property Correlations of various materials
    - Renewable Energy sources
    - ANN and Friction welding
    - Development of hybrid polymer composite materials

In the above areas, activities such as joint guidance for PhD, submission of Joint Research Proposals to funding agencies, Collaborative Research work leading to joint publications are planned. In addition, Departments of Chemical Engineering, Instrumentation Technology, Civil Engineering and Mechanical Engineering of SIT will work with identified faculty of NITK for UG and PG projects of students, conduction of joint workshops, utilization of lab facilities etc., the details of which are available in MoU between SIT and NITK

iii. IIIT, Bangalore

SIT and IIITB have agreed to work together in the discipline of information and communication technology. The cooperation shall be in the areas of teaching, education and research. Faculty and student exchange is also a part of planned activities.

In addition, joint research programs will be carried out in the areas mentioned below:

- Computer networks
- Image processing
- Speech processing
- Data mining

The details of the above activities are in the proceedings of the meeting held at IIIT Bangalore on 30th July 2010.

iv. University of Agricultural Sciences, Dharwad

University of Agricultural Sciences, Dharwad and SIT, Tumkur have entered into MoU to interface the following academic and research activities. The following departments of SIT, Tumkur are participating in the said activities covering the areas mentioned here under:

- Mechanical Engineering- Farm machineries and implements, processing equipments and biofuel.
- Biotechnology- Agricultural biotechnology, fermentation engineering, down stream processing
- Civil Engineering- Rain water harvesting, civil engineering consultancy, Providing consultancy for soil and water management
- Computer Science and Information Science Engineering- Providing software solutions to the related areas of agriculture.

v. Providing Technical Solutions for Local Needs

The Chief Engineer, Hemavathi canal Zone, Cauvery Neeravari Nigama Limited, Tumkur has brought the following two local issues and requested to provide technical solutions.

- Concrete linings along two main canals, Tumkur branch canal and Nagamangala branch canal have failed due to various reasons in spite of the routine and standard methods of execution.
- Avoiding water losses and damage to the infrastructure i.e. concrete linings and thus saving the precious water.

A MoU was signed between SIT, Tumkur and The Chief Engineer, Hemavathi canal Zone, Cauvery Neeravari Nigama Limited,Tumkur.
SIT has agreed:

- To study and analyze the stabilization of the canal network and to provide technical solutions by developing suitable construction technique to prevent the failure of canal sections in suddha soil stretches.

- To develop measuring devices (online wireless communication) which enable to maintain constant outgoing discharge independent of water levels in main canal and distributory canal with proper water audit system and to avoid water losses and damage to the infrastructure and thus saving the precious water.

The departments participating in this research and development methods are Civil Engineering, Instrumentation Technology and Computer Science & Engineering.

Modernization and Strengthening of Library

The objective of the library is to acquire, organize, evaluate, and provide information regarding resources and the latest developments in technologies that adequately support the curricula of the courses, research needs of the students, the teaching and research needs of the faculties.

The library offers services such as Reference, Referral, User Guidance, Circulation, Document Delivery, Photocopy etc.

It is proposed to procure books and journals for existing and new PG Programmes.

Table 4. Budget for Modernization and strengthening of Libraries and increasing access to resource.

Sub-Activities	Jan-13- Dec 14
Library i.e. books,e-books, journals, e-journals course specific softwares	**29.05**

2.7 Attach the summary of Training Needs Analysis (TNA) carried out. Also, provide Faculty Development Plan from the first 18 months to achieve improved competence based on Training Needs Analysis (TNA) in the following areas.

- Basic and advanced pedagogy training
- Subject / domain knowledge enhancement
- Attendance in activities such as workshops, seminars, etc.
- Improvement in faculty qualifications.
- Improving research capabilities

Faculty & staff development unit was constituted as per TEQIP guidelines. TNA was carried out with inputs obtained from HODs, Deans, faculty, technical and support staff. The TNA was carried out in the respective departments / sections.

Keeping the objectives of the department / section TNA was developed. In preparing TNA, SWOT analysis, department objectives, research needs of faculty, qualification upgradation needs, teachers appraisal by students were considered. In addition for HODs, Deans and other senior professors management capacity development programs are planned.

A detailed schedule and trainer organizations was decided for the in-house training programs by the faculty and staff development unit and was made available to all departments and sections. In addition, the schedule for the pedagogy, advanced pedagogy was also decided.

Departments focused on pedagogy, content upgradation relating to PG teaching and R&D activities. The following table summarizes the areas identified by the various departments.

Sl. No.	Name of Department	Training Areas
1.	Biotechnology	Basic and Advanced Pedagogy
		Clinical biotechnology
		Bio informatics & bio chemistry
		Agricultural biotechnology
2.	Civil engineering	Basic and Advanced Pedagogy
		Water management
		Pollution interaction studies, liquefaction (R&D) – geo environmental studies,
		Pavement management systems Payment analysis and evaluation
		Repair & rehabilitation of structures, structural dynamics, design of experiments and lab development (existing PG)
3.	Computer science & engineering	Basic and Advanced Pedagogy
		Cloud computing
		Multi core architecture
		Data mining
		Wireless communication & networking
4.	Chemical engineering	Basic and Advanced Pedagogy
		Bio chemical engineering
		Mathematical modeling & simulation of process equipment
		Catalysis
5.	Electrical & electronics engineering	Basic and Advanced Pedagogy
		Energy auditing and management
		SCADA
		Power systems
6.	Electronics & communication engineering	Basic and Advanced Pedagogy
		Signal processing
		Wireless communications
		Satellite communications
		VLSI design
7.	Information science engineering	Basic and Advanced Pedagogy
		Computer network

Sl. No.	Name of Department	Training Areas
		Security protocols
		DNA computing
8.	Instrumentation technology	Basic and Advanced Pedagogy
		Process automation
		Industrial instrumentation
		Embedded system design
		Bio medical signal processing
9.	Industrial engineering & management	Basic and Advanced Pedagogy
		Quality assurance
		Supply chain management
		TQM & six sigma
		Industrial automation
10.	Mechanical engineering	Basic and Advanced Pedagogy
		Advanced materials
		Nano materials
		Advanced thermal sciences
		Catia & Hyper Mesh
11.	Telecommunication engineering	Basic and Advanced Pedagogy
		Wireless communication
		Microwave communication
		Nano technology
		Digital signal processing
12.	Chemistry	Basic and Advanced Pedagogy
		Non conventional energy sources
		Environmental sciences
		Catalysis
13.	Physics	Basic and Advanced Pedagogy
		Nano physics
		Photonic materials
		Nano materials
14.	Mathematics	Basic and Advanced Pedagogy
		Linear algebra
		Numerical analysis
		Probability & statistics

2.8 Provide an action plan for training technical and other staff in functional areas.

The staff development cell in the meetings with HODs discussed extensively about training. Out of the discussions, it was felt that the following training is necessary for various categories of staff in addition to functional areas.

Area of training	Category of staff
Communication skills	Operators, Foremen, instructors, office staff & library staff
Maintenance (upkeep) of records and office procedures	Foremen, Operators, Instructors, T&P, library staff & office staff

Area of training	Category of staff
Computer networks	Operators & instructors
PC hardware & maintenance	Instructors
Attitudinal and mindset change	Non teaching staff
Training in domain areas	Foreman, Instructor, Technical helper

Table No. 5 : budget for faculty and staff development

	Activities	2013	2014	Total
FSD	Enrollment of faculty with BTech for MTech degree	0.00	1.20	1.20
	Enrollment of faculty with MTech for PhD degree	2.06	3.90	5.96
	Faculty training in subject domain	9.14	26.20	35.34
	Faculty training in pedagogy	0.53	5.40	5.93
	Organising inhouse training workshops in teaching/research subjects	11.09	22.20	33.29
	Paticipation of faculty in outstation seminar/ conferences/ workshops etc	3.00	28.05	31.05
	Training/Development of technial/support staff	3.30	4.45	7.75
	Others	0.00	0.00	0.00
	Sub-total	29.13	91.40	120.53

UNDERTAKING

This is to certify that an actual training needs analysis has been taken by the Institution, and that the Institution's training/development plan as described above is based on the felt-needs of the concerned Departments/Sections aligned with the Institution's objectives and priorities.

(Dr. M.N. Channabasappa)
Signature with date

2.9 Describe the relevance and coherence of Institutional Development Proposal with State's/National (in case of CFIs) Industrial / Economic Development Plan.

Karnataka state's **New Industrial Policy for 2009-2014** was announced in February 2009. Salient features of the policy include (a) to make the state prosperous through development of human & natural resources; (b) to provide additional employment for about 10 lakh people during the five year period; (c) increase the share of industry to state's GDP to 20% by 2014; (d) to double the exports from the current level of Rs.1.3 lakh crores; (e) thrust on skill development & entrepreneurship promotion; and (f) focus on development of MSME sector. The policy envisages a boost to growth in various industries like, manufacturing, exports, MSME etc. The policy targets for creation of employment and additional investment during the five year period are as follows:

By the end of the year	Creation of additional employment (lakhs)	Additional investments (Rs. crores)
2009-10	1.00	30,000
2010-11	3.00	90,000
2011-12	5.00	1,65,000
2012-13	7.50	2,40,000
2013-14	10.00	3,00,000

The planned investment of Rs.3.00 lakh crores during the five year period would take the industrial activity in the state to a high growth trajectory. There is ample scope for the Institute to design its strategies and align the same with the objectives of the industrial policy. Some of the specific measures suggested by the policy and its linkages with the Institutes strategic plan are given below.

#	Policy measures	Linkages with IDP
1	Development of human resources & generation of additional employment	Offering PG programmes in various areas of technology
2	Thrust on skill development	Designing and offering industry-specific training programmes
3	Providing quality infrastructure across the state	Starting PG programme in Transportation Engineering & providing consultancy services
4	Starting 8 major industrial corridors under Suvarna Karnataka Development Corridor Scheme	Starting PG programme in Transportation Engineering & providing consultancy services
5	Development of MSME sector	Scope for providing training and consultancy to MSME and start-up firms and R&D for development of products and technology.
6	Development of special industrial zones for steel, cement, food processing, IT/BT, automobile, garments, bio-tech, power generation etc.	Scope for training & consulting for various departments like chemical, bio-tech, mechanical, electrical, computer science, instrumentation etc. Starting bio-technology finishing school. Faculty deputation to industrial zones.
7	Promote private sector investment for skill development	Scope for designing continuing education programmes for personnel from various industries.

8	Encourage regular industry-institution interface for skill development	Continuous interaction with industrial units for skill set identification and development. Collaborative research with industry through MoUs.
9	Inculcating entrepreneurial skills among youth, especially women	Scope for training programmes in various technologies.

The policy document has also identified various geographical locations for starting new industrial units. The institute plans to have an in-house mechanism through the Industry-Institute Interaction Cell to co-ordinate with various plan implementing and monitoring agencies like District Industry Centres to identify various opportunities thrown open by the industrial development in areas in and around Tumkur.

The **Millennium Biotech Policy - II** of Karnataka gives emphasis on development of qualified manpower and infrastructure. One of the policy measures announced relates to establishment of BT Finishing Schools to equip students, particularly graduates and post-graduates, with necessary employable skills to make them industry-ready. The Institute has already initiated the steps for establishment of **BT Finishing School**. This is one of the activities planned during TEQIP-II. Similarly, the **Karnataka Semiconductor Policy 2010** lays emphasis on promotion of industrial units engaged in semiconductor design and manufacturing. Government wants to promote Karnataka as a destination for ATMP (Assemble-Test-Mark-Pack) and ancillary units. This also provides ample scope for the Institute to enhance industry-interface for various activities like deputation of faculty, collaborative research, centre for product development and designing training programmes.

The **National Urban Transport Policy** of Government of India emphasises on capacity building through sustaining and enhancing the expertise and sponsoring research. It also suggests skill development through strengthening the academic programmes, especially in the post-graduate level, in urban transport and related areas. The Institute is starting a new PG programme in **Transportation Engineering and Management**.

From the above, it can be seen that the objectives set and various activities planned under TEQIP-II are linked to various policies of the state and central governments.

2.10 Describe briefly the participation of departments/faculty in the proposal preparation and implementation.

During TEQIP-I, there was significant improvement in teaching-learning programme of UG programmes, in terms of curriculum (academic autonomy), faculty development and laboratory upgradation. Six exclusive R&D labs were established in various departments and 49 candidates are currently pursuing their doctoral studies in the Institute. After the completion of Phase I, the activities initiated such as in-house workshops, deputation to conferences and workshops outside, were continued. In addition, to enhance R&D activity with institutions of advanced learning, linkages were established with professors of IISc and IITs for collaborative research. Our faculty interacted with CPRI, GTRE, SERC, BARC (CSIR labs). We have developed linkages with industries like Ultra Tech Cements, Encore Technologies, National Instruments, Infosys, TCS, Wipro etc. A strategy was also developed to strengthen alumni network during its annual meet on 2nd October 2009 and also during the Bangalore Chapter meet on 1st May 2010. More than 500 alumni have been traced and some of them are in decision making level in their organizations. There are plans to set up an alumni centre in IBM and one more in Dubai. In this background, the process of proposal preparation for TEQIP-II was initiated in April 2010.

The process started with first round of meeting among the Director, Principal, Deans, HODs and TEQIP Coordinator. Department level coordinators were identified to collect information at each department. This was followed with presentation on SWOT to HODs and coordinators. Various rounds of meetings were held in each department involving various stakeholders to develop SWOT. Department wise brainstorming sessions were held during May 2010 involving all faculty members, selected representatives from non-teaching staff and students. The following committees were constituted for preparation of IDP and implementation of the project. Functions of each unit were clearly defined.

a) TEQIP Cell headed by the Director & Project Authority
b) Procurement Unit headed by the Principal
c) Academic Unit headed by Dean (Planning & Development)
d) Finance Management Unit
e) Monitoring & Evaluation Unit
f) Faculty & Staff Development Unit
g) Research & Consultancy Cell
h) Industry Institute Interaction Cell
i) Equity Action Cell

About 50 faculty members are involved in various committees listed above. Small sub-groups of 3-4 faculty members were entrusted with compilation of data relating to various aspects of IDP as follows:

a) SWOT Analysis leading to Strategic Plan
b) Collection & compilation of baseline data from various departments
c) Research & Development activities, detailed action plans and collaboration with institutes of higher learning
d) Industry-Institute interaction cell for detailed action plan and MoUs with industrial houses
e) Procurement plan and detailed time-bound budget
f) Training Need Analysis at department level & compilation of data
g) Equity action activities

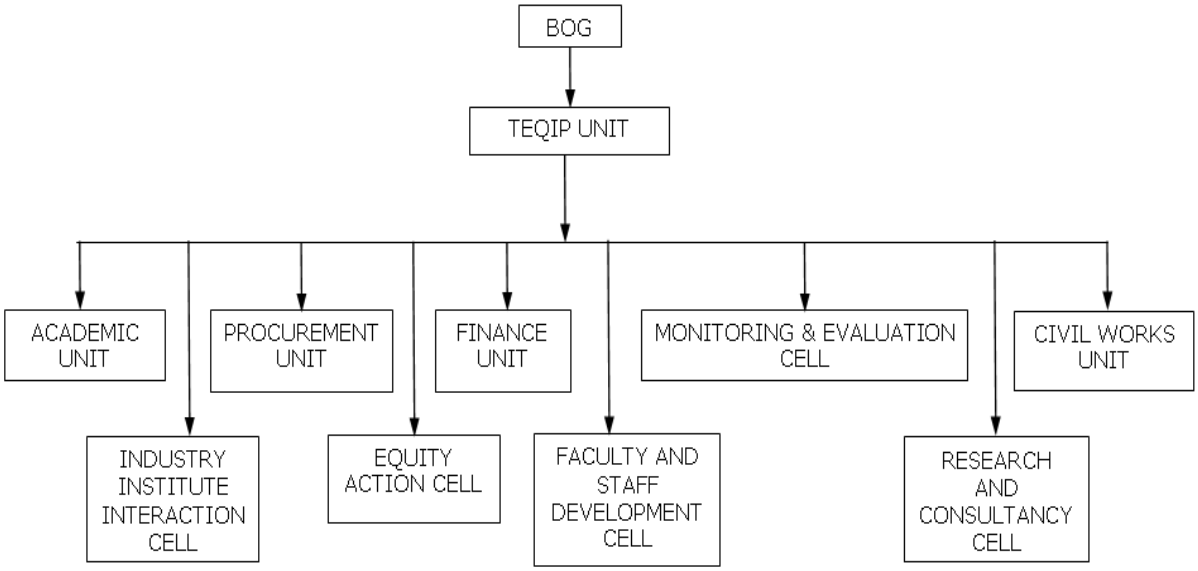
All faculty members from all departments were involved in supplying data and providing assistance to the above sub-committees. Each faculty member was

asked to provide details regarding their research interest, training needs etc. Faculty members with doctoral degree were required to provide details on future research plans, funded projects, collaborations with other institutes etc. Detailed plans were chalked out for training the technical supportive staff and administrative staff. Special care was taken to ensure representation from all stakeholders. Many rounds of meetings were held at the central level as well as departmental level between April and August 2010 to give clarity relating to various aspects of IDP.

Finally, the TEQIP coordinator, along with a group of 5 senior faculty members, compiled the data provided by various sub-committees to give final shape to the IDP.

2.11 Institutional Project Implementation Arrangements

Various committees have been constituted for implementation of TEQIP activities. Representation from all departments across various activities is ensured for successful implementation of the project. Functions of each committee have been clearly defined. About 50 faculty members are involved in these committees.



2.12 Institutional Project Budget

This is obtained from sum of Table 1 to Table 9

SL. No.	Activities	Project Life Allocation	2012-13	2013-14
1	Infrastructure improvements for teaching, training and learning through:			
	(i) Establishment of new laboratories for new and existing PG programmes, faculty research, etc	**--**	--	--
	(ii) Updation of learning resources	**64.20**	---	64.20
	(iii) Procurement of furniture			
	(iv) Modernization and strengthening of libraries and increasing access to knowledge resources	**29.05**	--	29.05
	(v) Refurbishment (Minor Civil Works)			
2	Providing Teaching and Research Assistantships for significantly increasing enrolment in existing and new Masters and Doctoral programmes in Engineering disciplines	**80.40**	30.96	49.44
3	Enhancement of R&D and institutional consultancy activities	**32.70**	14.04	18.7
4	Faculty and Staff development for improved competence based on TNA	**110.3**	29.13	81.17
5	Enhanced interaction with Industry	**13.5**	3.5	9.9
6	Institutional Management Capacity enhancement	**17.20**	15.5	1.7
7	Implementation of institutional reforms	**20.41**	17.56	2.85
8	Academic support for weak students	**11.15**	4.62	6.53
9	Incremental Operating Cost	**21.14**	5.78	15.35
	GRAND TOTAL	**400.00**	**121.1**	**278.9**

2.13 Project Targets for Institutions under Sub-Component 1.2

Sl. No.	Deliverables	Base-Line (2009-2010)	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 (Enrolment) (b) Doctoral Programme in Engineering (enrolment)	 80 06	 168 20	 190 30
2	Revenue from externally funded R&D projects and consultancies in total revenue (Rs. In lakh)	24.00	60.00	120.00
3	Number of a) Research publications in refereed journal • National Journals • International Journals b) Citations c) Patents obtained / filed d) Books e) No. of R&D projects commercialized	 06 24 128 00 01 02	 11(6+5*) 43 (24+19*) 160 11 02 --	 20(11+9*) 61 (43+18*) 200 22 (11+11*) 06 --
4	IRG as % of total recurring expenditure	1.372	2.5	5
5	Number of co-authored publications in refereed journals (a) National (b) International	 01 23	 20 30	 30 50
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	 69% 25% 3 3.5	 74% 30% 4 4.5	 80% 35% 5 5
7	Number of collaborative programmes with industry (i) Industry research (ii) Industrial Training (iii) Curriculum Development (iv) Placement for M.Tech Students (v) Industry specific Electives (vi) Industry personnel for Project evaluation (vii) Industry Internship	03	05	07

Sl. No.	Deliverables	Base-Line (2009-2010)	Targets to be achieved	
			At the end of 2 years of joining the project	By project closing
8	Accreditation Status (obtained and applied for)	100%	100%	100%
9	Vacancy position for faculty and staff	NIL	NIL	NIL
10	Percentage of regular faculty with PhD in Engineering disciplines	16.81%	22%	27%

B. The Action plan for achieving these targets have been enumerated in detail in the relevant sections, but however the following section provides a brief account of the action plan.

Sl. No.	Deliverables	Response
1	Number of students registered for (a) Masters in Engineering programme (Enrolment) (b) Doctoral Programme in Engineering (enrolment)	a) • Starting 7 new PG programs • Increasing the intake of existing PG programs • Offer of teaching assistanceship to Non GATE students b) • new departments will be upgraded as research centres. • Joint Ph.D. programs are planned. • Research assistanceship is offered for 10 full time scholars.
2	Revenue from externally funded R&D projects and consultancies in total revenue (Rs. In lakh)	• More than 20 proposals have been submitted to various funding agencies. • Additional projects proposals will be submitted to funding agencies during the project period.
3	Number of a) Research publications in refereed journal • National Journals • International Journals b) Citations c) Patents obtained / filed d)Books e) No. of R&D projects commercialized	• Large number of research areas have been identified by our faculty and detailed research action plan is made by individual faculty members. • 45 research scholars are pursuing Ph.D. in our research centres. • Incentives are given for publications in national and international journals also for book writing and for securing patents and also for R&D projects
4	IRG as % of total recurring expenditure	• This is achieved by augmenting consultancy and testing. • By securing more number of sponsored projects by organizing training programs

Sl. No.	Deliverables	Response
		for industry personnel and for others.
5	Number of co-authored publications in refereed journals (c) National (d) International	• Large number of collaborative research projects have been identified by our faculty with faculty of other institutes and industry.
6	Student Credentials (c) Campus placement rate of • UG Students • PG Students (d) Average Salary of placement package for (Rs. in lakh) • UG Students • PG Students	This is achieved by increased industry interaction in terms of : • Industry research for PG project work • Industrial training is made compulsory • Arranging placement oriented training programs • Arranging skill development programs for students
7	Number of collaborative programmes with industry	MoUs have been signed with more than 40 industry. Under these MoUs : 1) Industry research 2) Industrial Training 3) Curriculum Development 4) Placement for M.Tech Students 5) Industry specific Electives 6) Industry personnel for project evaluation 7) Industry Internship Have been planned.
8	Accreditation Status (obtained and applied for)	It is 100% as of now and the same status will be maintained in future.
9	Vacancy position for faculty and staff	• No vacancy • Faculty recruitment is made in the beginning of every academic year.
10	Percentage of regular faculty with PhD in Engineering disciplines	• Faculty deputation to Ph.D. since 1992 • Faculty also registered for Ph.D. on part-time basis • Provision for full-time Ph.D. registration is available.

2.14 Give an action plan to ensure that the project activities would be sustained after the end of the Project.

It is important to continue and sustain the momentum gained through the project for the period beyond the project life. The sustainability depends on two aspects: (a) continuation of activities initiated and (b) making the funds available for the same. Keeping in mind the above aspects, the Institute has made following plans for sustaining the gains to be derived from the project:

1. High-level committees will be set up to monitor the continuation of activities in the following areas:
   a) Continuous improvement of quality of education
   b) Training & Development of faculty and staff
   c) Enhancing R&D activities
   d) Increased interaction with industry and R&D labs
   e) Continuation of activities under various MoUs signed

2. The investments made in TEQIP-II would be viewed as a starting point for the research activity to continue in the future. As a policy matter, it would be made mandatory for each faculty member with Ph.D to have atleast one funded project by the end of the project period, which would extend beyond the project period. Provisions would be made in such projects for non-recurring expenses aimed at building required infrastructure.

3. The following activities are expected to result in increased non-fee based IRG:
   Research sponsorship from funding agencies (institute's share)
   Revenue generated from consulting and testing services
   Revenue from training/continuing education programmes
   Industry-institute interaction programmes

4. The four funds namely, Corpus Fund, Faculty Development Fund, Equipment Replacement Fund and Maintenance Fund have already been created. The amounts deposited in the same are given below. No expenditure has been booked from these funds so far. It is planned to contribute a minimum of 0.5% of total recurring expenditure of the institute to each fund every year. No expenditure would be booked against these funds till the end of TEQIP-II

#	Name of Fund	Contributions in Rupees Lakhs				Total (Rs. lakhs)
		2006-07	2007-08	2008-09	2009-10	
1	Corpus Fund	25	25	25	25	**100**
2	Staff Development Fund	5	25	25	25	**80**
3	Equipment Replacement Fund	5	10	10	5	**30**
4	Maintenance Fund	5	5	5	10	**25**
	Total	40	65	65	65	**235**

5. Apart from the above funds, it is proposed to create the following funds. Annual contributions will be made to these funds and no expenditure would be booked till the end of the project period. A share of increased non-fee based IRG would be invested in these funds.
   a) Scholarship/teaching assistanceship Fund (for meritorious students)
   b) Research and Development Fund (for faculty and students)

All the above are expected to provide continuity and sustainability of the activities initiated during the project period.

2.15 Procurement plan under TEQIP phase II (Software and LRs):

Sl. No.	Software	Department	Cost
EE1	PSIM Software	Electrical (direct contract)	898000.00
ME1	Manufacturing Process Simulation Software KIT	Mechanical (direct contract)	975000.00
ME2	Thermal Analysis Software (Inverse solver, IHCP)	Mechanical (direct contract)	300000.00
EC2	System design platform development environment for visual programming	Electronics (direct contract)	350000.00
IEM1	CIM SIM – For Advanced Automation Simulation Software	Industrial Engineering & Management (direct contract)	600000.00
TE1	Electromagnetic Simulation Tool	Telecommunication (direct contract)	379800.00
CIV1	Three-dimensional explicit finite difference program for engineering mechanics computation.	Civil (direct contract)	1705582.00
CS1	i - Sense Wireless Sensor Network	Computer Science (shopping)	500000.00
CH1	Chemical process design and simulation software	Chemical (direct contract)	305000.00
LIB1	Plagiarism software	Institutional (shopping)	405000.00
LIB2	Books	Institutional (direct contract)	1000000.00
LIB3	Journals	Institutional (direct contract)	1500000.00
QEEE	Hardware components (QEEE)		800000.00
		Total	97,18,382.00

Table 6. Summary of procurement plan

UNDER TEQIP-II subcomponent 1.2		
		Amount in Rs.
1	**Software**	**64,18,382=00**
2	**Books**	**10,00,000=00**
3	**Journals**	**15,00,000=00**
4	**Hardware (QEEE)**	**8,00,000=00**
	TOTAL	**97,18,382=00**
	GRAND TOTAL (TEQIP-II 1.2)	**97,18,382=00**