CRITERIA VII: INNOVATIONS AND BEST PRACTICES

7.1 Environment Consciousness

7.1.1 Does the university conduct a Green Audit of its campus?

Yes although the process of auditing is informal. The University has very lush green campus. The Horticulture Section of the University is responsible to maintain the lawns, fruit orchard, Nirvana Park (A 6 Acre Park containing 3000+ plants of difference species) and other areas. The University has also won many prizes in state level flower competitions.

7.1.2 What are the initiatives taken by the university to make the campus eco-friendly?

- Energy conservation
- Use of renewable energy
- Water harvesting
- Check dam construction
- Efforts for Carbon neutrality
- Plantation
- Hazardous waste management
- e-waste management
- any other (please specify)

The University is taking the possible initiatives for energy conversation and the new buildings of the University are being designed accordingly to save the energy. The employees and students are advised to use the natural light, turn off the switches of lights, fans etc. whenever not in use, use of LCD monitors for computers, use of tube lights instead of bulbs etc. There are sufficient cross ventilation in laboratories and class rooms to avoid the unnecessary use of electricity. The University has also installed the Power Factor Correction System to save the electricity.

The University has taken several initiatives to make eco-friendly. The University has hired an outside consulting firm for energy auditing and its recommendations are being implemented throughout the University. The use of solar energy specially for heating water in student hostels has been attempted in one of the largest hostel on campus and has been a successful experience. The street lighting in some sections has been made functional with solar energy. There has been wide plantation throughout the campus and Thapar Institute of Engineering & Technology University is one of the greenest campuses in the region. The university has dedicated plantation areas and one such park "Nirvana" has come up beautifully during the last three years.
The University has made provisions of rain water harvesting system in all the new buildings.

The biological waste from various laboratories is collected by Semb-Ramky Environment Management Pvt. Ltd., Ludhiana on weekly basis as per MOU signed between university and them. All other solid waste of residences, hostels and campus is being collected and disposed off at Municipal Corporation dumping ground. Treatment of waste water by

Sewage Treatment Plant (STP) and reuse of treated water for irrigation.

The University has followed the Government of India notification related to e-waste (Management & Handling) Rules 2011 that came into effect from May 1, 2012. These rules were circulated to all the Heads of Units and were advised to understand the definition of the e-waste mentioned at page no. 28, sub clause (k), of clause 3 of the said rules. The University comes under the definition of Bulk Consumer which is also mentioned on the same page under sub clause (c) of clause 3 of the said rules and the responsibilities of the "Bulk Consumer" mentioned at page 31 under clause 6 of the said rules and the same has been understood by all concerned. All the Heads of the Departments / Schools / Centres / Units are required to maintain the stock of the e-waste generated in their respective Departments / Schools / Centres / Units in the Form-2 of the said rules. They are supposed to complete entries from Sr. No. 1 to 5 of the Form-2.The e-waste generated can be sent to Central Stores once in six months with a copy to Chairperson, e-waste Management Committee.Central Stores has identified a specific area to store the e-waste sent by different units for final disposal to the authorized vendor M/s Singbros Mobility Solutions, D-85, Focal Point, Patiala.

Following steps have been taken for carbon neutrality :

- **The students are not allowed to use the powered vehicles in the campus. They use only bicycles to move in the campus.**
- **Only LPG cylinders are used in hostels and other places for cooking.**
- **Installation of Solar Water Heating system at Derabassi Campus and University is also planning to install the same at Patiala campus also.**

7.2 Innovations

7.2.1 Give details of innovations introduced during the last four years which have created a positive impact on the functioning of the university.

Innovation in quality systems

The University has established, documented and implemented a Quality Management System. Continuous improvement in the implementation and effectiveness of the quality management system is ensured through continuous reviews and internal audits. The University has:

- **Identified the processes needed for the quality management system and their application throughout the organization process are being carried out in the University. Documented procedures have been developed for the management activities, provision of resources, instructional design, delivery and control and measurement.**
- **Determined the sequence and interaction of the processes of the quality management system. This includes process pertaining to instruction planning, delivery and control as**

well as support, service and administrative processes.

- **Determined the criteria and methods needed to ensure that both the operation and control of these processes are effective.**
- **Ensured that all the resources and information required for operation and monitoring of the processes are available from time to time.**
- **Has planned arrangements for monitoring measurement and analysis of the processes.**
- **Has implemented the planned arrangements along with their control mechanism for the achievement of planned results and for continual improvement of the processes.**

Innovations in academic activities

- **The student admission process for the Undergraduate program is made with the help of a e-governance package. Even student registration and their complete academic performance form the day of admission to the passing out is maintained on this system.**
- **The University has developed a system for collecting feedback on student reaction for each course online and the results are automatically analyzed and made known to the faculty members.**
- **The University has a Performance Incentive Scheme for its entire faculty. The four key result areas identified for improvement include: teaching quality; professional/career development of teachers; relation building with industry, alumni and community and implementation of other co-curricular and extra-curricular activities of students.**

CONTINUAL IMPROVEMENT

The University continuality improves the effectiveness of the quality management system through the use of quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review. At the time of every management of review, through the measure of each objective and its comparison with earlier level of that objective, the trends are ascertained. Action points are then listed to continually improve the system. The status is reviewed in the subsequent management review meetings.

CUSTOMER SATISFACTION

The University has made arrangements to monitor information related to customer perception to ascertain whether the University has met customer requirements. The information is collected using the following established mechanism:

- **Feedback from the students at the end of every semester on various aspects of the course taught to them.**
- **Feedback collected from the industry during the campus interviews.**
- **Feedback from students after they spend six months in industry for their project semester.**
- **Feedback from the six months project semester of the students, on the quality of students and their usefulness to the industry.**

The information thus collected is summarized, and analyzed and the results of the analysis are used as a feedback to further improve the system.

INTERNAL AUDIT

The University conducts internal audits every six months to verify whether quality managements system conform to the quality plan and to determine that it is effectively implemented and maintained. The scope covers all activities of the quality system affecting quality of instruction. The responsibility of scheduling internal quality audits lies with the M.R. The arrangements made for conducting internal audits are:

- **Documented procedure for planning and implementing internal quality audits has been established and maintained.**
- **The frequency of the internal quality audits has been decided based on the status and importance of the activity but in no case the frequency shall be less than once in six months.**
- **The audit of an area/activity would be carried out by trained personnel other than those directly responsible for the said activity.**
- **The results of the internal quality audits are recorded and report is given to concerned functional Head.**
- **Timely action on the reported non-conformities is planned and taken by concerned functional Head.**
- **Follow-up audit is conducted in-order to verify and record the implementation and effectiveness of the corrective action(s) taken.**
- **The results of the internal quality audits are sent to M.R. for management review and record.**

MANAGEMENT REVIEW

The review of the quality system shall be carried out once every six months to ensure continuing suitability, adequacy and effectiveness in satisfying the requirements of the standard and the quality policy of the University. The review includes assessing opportunities for improvement and the need for change to the quality management system.

7.3 Best Practices

7.3.1 Give details of any two best practices which have contributed to better academic and administrative functioning of the university.

Best Practice -1

1.0 Continual Improvement of academic processes and programs at Thapar Institute of Engineering & Technology University

2.0 Goal

The aim of the practice followed by the University is to continuality improve the effectiveness of its laid down systems and processes by regularly assessing and evaluating the extent to which the University quality policy and objectives are being attained. For this purpose, a quality policy has been established, displayed at prominent locations in the University and everyone has been made to understand the intent of the quality policy and the commitment contained in it.Quality objectives along with their means and measures have been established for various functions and levels. The management periodically reviews the policy and objectives for continuing suitability, adequacy and effectiveness by provision of adequate resources.

3.0 The Context

The University has committed itself to the development and implementation of a continuous improvement process for improving the effectiveness of the academic processes and programs. For measuring the effectiveness of the processes, key academic objectives have been identified. Targets are set against each of these objectives that define the expected level of attainment for each objective. The data is collected periodically from each stake holder at the end of each semester and reviewed in a meeting of the top officials of the University. Summary of the results of the evaluation indicating the level achieved is prepared and used as an input for setting targets for the next year. The results of these processes are utilized to effect continuous improvement of the academic processes and the programs offered. For doing this, assessment methods are used to gather the data upon which the evaluation of each objective is based.

4.0 The Practice

Each academic program completes a SWOT analysis at the beginning of each academic year in its faculty meeting through brainstorming. The results of the SWOT analysis are then used to identify key and critical areas of concern where action plans must be initiated to improve performance. These critical areas are then transferred to a "University Risk Management" (URM) sheet which clearly describes the risk of not undertaking this improvement in the short and the long term followed by an action plan, responsibility and the completion date till the time the risk level on the URM sheet is categorized as low. A blank sheet showing the URM form is given below:

URM SHEET: DEPARTMENT OF CHEMICAL ENGINEERING, THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY UNIVERSITY, PATIALA

Location/ Function	Risk Description	Risk Level & Reasons (Why)	Action Steps	By Whom (Accoun-tability)	By When (Time frames)	How/Method	Target Risk Level	Comments

Also, targets are set for critical academic and research parameters critical for the growth of the University and are reviewed periodically. The targets are set for the following key academic performance indicators:

1. **Academic Credit Score: The credit score is calculated for each program and is indicative of the course weight and the number of students who undertake that course. The score for a program provides an insight into the faculty requirements for that program and the teaching load of the department. This score is calculated separately for both UG and PG programs.**
2. **Faculty strength and student-teacher ratio**
3. **Number of faculty with PhD**
4. **Number of PhD's produced and admitted every year**
5. **Number of Publications in SCI journals**
6. **Number of sponsored research and infrastructure projects**
7. **Number and amount of consulting assignments**
8. **Number of full time Teaching Assistant/Research Scholars**
9. **Number of new UG or PG programs proposed**
10. **Student Placement separately for UG and PG**
11. **Collaborations, conferences and short term courses**

The data is collected for each program and reviewed. The results of this analysis are used to plan targets for the subsequent years.

5.0 Evidence of Success

The action plan as listed in the URM sheets is monitored to evaluate the effectiveness of the actions taken. The abstract of the URM sheets for 2012-13 is as under:

There are in all 14 departments/school/functions for which the URM has been prepared along with the detailed SWOT of each departments. In all there are 62 identified Risks across the 14 departments. The risks have been categorized under broad headings such as faculty, research output, infrastructure, research scholars etc. The URM projects are periodically reviewed for evaluating the success of each project in reducing the risk.

The target setting for each department has helped to focus on its performance every year. The best performing department is announced on Teacher's day every year. A blank sheet for the research targets for the previous year(s) is given below.

RESEARCH ACTIVITIES:														
		DBTES	CHED	CIVIL	CSED	ECED	EIED	MED	SCBC	SMCA	SMSS	SPMS	SOM	TOTAL
SCI Journals														
	2009-2010													
	2010-2011													
	Proposed:2011-12													
International Conferences														
	2009-2010													
	2010-2011													
	Proposed:2011-12													
Research Projects (Rs Lacs)														
	2009-2010													
	2010-2011													
	Proposed:2011-2012													
Number of Projects														
	2009-2010													
	2010-2011													
	Proposed:2011-12													
Patents/Copyrights														
	2009-2010													
	2010-2011													
	Proposed:2011-12													
PhDs Awarded														
	2009-2010													
	2010-2011													
	Proposed:2011-12													
Consultancy & Testing (in lacs)														
	2010-2011													
	Proposed:2011-12													

6.0 Problems encountered and resources required

The University did not have much problem in implementing the above. Such practices are routinely used by the industry and corporate houses but are rarely used in academic institutions. So it needed some training and motivation to clearly explain the usefulness of these practices. The practice has been in place since the last more than two years and because of its immense benefits has been adopted throughout the University.

Best Practice - 2

1.0 Scheme for awards of excellence for faculty who have excelled in teaching and research at Thapar Institute of Engineering & Technology University

2.0 Goal

For Thapar Institute of Engineering & Technology University, the processes used to evaluate and provide feedback about the performance of the faculty working with us is extremely important. If these evaluation processes are properly designed, these can help the University thrive by providing appropriate rewards and encouragement for good performers, and guidance about how to improve their performance to others. The existing evaluation processes for faculty did not appropriately make the distinction based on performance and may result in lower morale, engagement and productivity. The University recognizes the importance of a faculty performance evaluation process that is fair and that provides productive and appropriate incentives to faculty. As a result, a new performance incentive scheme was designed to reward performers and encourage all others to improve their performance.

3.0 The Context

No faculty performance review process can be free of issues or problems. Bearing this in mind, a committee was constituted to review the existing performance review system and recommend changes and policies to improve the process. The committee formulated a new Performance Incentive Scheme (PIS) that is more transparent and better understood, more equitable, and provide more useful feedback to faculty members. The implementation of this new scheme since last 5 years has enhanced morale, rewarded good performers, motivated and reinforced productive activity of faculty at Thapar Institute of Engineering & Technology University. The aim of the new evaluation process is to appropriately quantify the academic and research performance of all faculty members at Thapar Institute of Engineering & Technology University through a self appraisal system wherein marks are awarded for pre-defined activities of a faculty during an academic year (July 1 to June 30 next year). The marks are awarded for all activities of faculty which directly contribute to attaining the documented quality policy and objectives of the University. The method is devised in a way so as to eliminate/reduce subjectivity of measuring performance of a faculty. The goal is create a measure by which faculty can self assess its performance. The good performers are rewarded with incentive for that year.

4.0 The Practice

The faculty is requested to fill up an online form wherein he reports his academic (teaching) and research performance besides other services or co-curricular activities he/she had undertaken during the previous year. The teaching performance is judged on the basis of results of a Student Response Survey (SRS) form for each faculty and each subject. The students are required to fill up this form online. The results of the survey are used as a measure of teaching potential and quality of a faculty. The scores are compiled using a customized software. Based on the SRS score obtained (given by students) a teaching score for all the subjects taught by the faculty during the two semesters is generated. The research scores are awarded by considering publications, research projects, and student guidance during the year. For all other activities undertaken by the faculty during the year, perception

score is given by the reporting officers. The total marks obtained by each faculty are then tabulated and sorted in a descending order. In order to make the scheme broad based, the University gives incentive to about 55% of the faculty strength and those eligible are divided into four groups A, B, C and D. The group A is awarded up to a maximum of three months of additional salary for the year. The Group B, C and D are given 1.5 months, 1 month and 15 days additional salary respectively for the year. The factors that are presently being considered for PIS evaluations are:

(I) Teaching Quality: Judged through performance in lectures, tutorials, and practicals by using Student Reaction Survey results

(II) Professional / Career Development considers

Publications: **Faculty is awarded score for publications. Publishing in good journals (listed in SCI with high impact factor) are given higher marks. Non SCI publications are given lower scores. Since quality of publication is considered more important than mere quantity, the number of non-SCI publications that can used for scoring are restricted during the year. The conferences publications have are given weightage. Further, for all publications the credit is divided equally amongst the co-authors.**

Projects: **Project amount received from outside agencies is considered. The score is given based on the amount received during the year and like in publications the credit is divided equally amongst the PI and Co-PIs.**

Student Guidance: **The faculty is awarded score for guiding PhD and Master's thesis. Again the credit is equally divided amongst the supervisors, in case there is more than one supervisor.**

(III) Perception: Administrative Responsibilities, Student and academic activities and Relationship building activities are considered under "Perception".

5.0 Evidence of Success

The new evaluation scheme has been in use since the last 5 years. The SRS scores have been solely used as a feedback tool for improving the performance of the faculty. The SRS scores emphasize on the primary responsibilities of a teacher and include feedback on intellectual competence, integrity, a spirit of scholarly inquiry, effective knowledge dissemination, improved ways of presenting material and the ability to stimulate and cultivate the intellectual interest of students. Most faculty members have responded favorably to this new system of evaluation of their teaching skills although some improvements may still be required. Research is a critical component of the University Quality Policy. In all, refereed publications of high quality (SCI/Impact Factor) are expected as evidence of scholarly productivity. Quality is considered more important than mere quantity. Significant evidence of research publications and earning sponsored projects is considered important for the growth of the academic profile of the University. There has been a significant increase in the research output of the University since this new scheme has been introduced. The number of SCI publications has increased significantly. Similarly, the number of sponsored research projects is also on rise. There are over 60 ongoing sponsored projects at any given point of time and the number is going up. The research funding has also seen a significant jump.

The overall performance of each department is measured by commuting the individual faculty scores of the department obtained from the PIS score. The results are summarized and presented in a faculty meeting of the University. The overall score of each department is computed and the department with the highest score is awarded as the best for the year. This has created a healthy competition where each department is making efforts to excel in one or more parameters.

6.0 Problems encountered and resources required

As expected there were many misgivings amongst the faculty about the new scheme of evaluation of faculty performance. Initially about 20 to 25% of the total faculty was given incentive. The number was raised to about 55% subsequently to make it broader based. All misgivings of the faculty in accepting the Performance Incentive Scheme were eliminated through a series of meetings and personal contacts by the Director and other senior functionaries of the University. The scheme has created a positive attitude and zeal to excel.

Benchmarking developed by the University:

The University has used most of the quality benchmarks as given by UGC to create radars for measuring performance. The benchmarks for various activities of the University are proposed as under:

ACADEMIC PARAMETERS			
S No	**Indicators**	**Method of Computation**	**Benchmark value**
1	**Frequency of Syllabus revision**	**No of subject in which major revision was done in last review / No of subjects being taught**	**100%**
2	**Average no of working hrs of library**	**No of hrs library is open/ total no of hrs in a year**	**100%**
3	**Average no of activities like conducted / year** **1. Workshops** **2. Seminars** **3. Symposia/Conference**		**Per Dept/ School** **1. Two** **2. Two** **3. One**
4	**Demand Indicator**	**Total no of admissions in all courses per year / total no of candidates who applied**	**1:10**
5	**New programs introduced in last year**	**New programs launched / total no of programs**	**5%**
6	**Percentage increase in books/journal in last year**	**No of books/journals purchased in last year / No of books available at the beginning of the year**	**5%**
7	**Utilization of Central Library**	**Total no of visits / Total no of students and teachers x 180**	**30%**
8	**Assessment of teachers by students**	**No of courses in which assessment has been introduced / Total no of courses**	**75%**
9	**Number of NET/SET/GATE qualified students**	**Total No of GATE qualified students admitted / Total applications for PG programmes**	**50%**

RESEARCH PROFILE			
1	No of research publications per teacher per year in refereed journals	Number of Research Publications / No of teachers	1
2	Research grant received per teacher per year	Total research grant received / No of teachers	
3	Percentage of teachers attending seminars/ conferences by invitation or giving invited presentations per year	Total no of teachers attending seminars/ conferences by invitation or giving invited presentations / Total no of teachers	5%
4	Percentage of Departments/ Schools getting departmental support from various agencies like UGC, SAP, COSIST etc.	Total no of depts. who get support / Total no of departments/schools	20%
5	Percentage of faculty getting awards, honors	Total no of awards/honors / Total no of teachers	1%
6	Citation Index	Citation value of all research papers/ Total no of research papers published	1 per paper
7	Percentage of full time research scholars	Total no of full time research scholars / Total no of research students	50%
GOVERNANCE			
1	Actual teaching days per yr		180
2	Minimum workload of teachers		40 hours
3	Teaching – Non teaching ratio		1 : 1
4	Percentage of teaching posts filled up	Teaching posts filled / Total no of teaching posts	100%
5	UGC Regulations: Whether UGC directions followed for minimum Qualification	No of teachers qualified as per UGC regulations / total no of teachers	100%
6	Timely declaration of results	No of exams in which results were declared in time / total no of exams	100%
8	Resources generated through external resources	Resources generated through external sources / total plan budget for the year	20%
9	Percentage of depts. Collaborating with other agencies	Total no of collaborations / total no of departments	100%
10	Percentage increase in physical infrastructure	Increase in physical space / space at the beginning of the year	5%

Any other information regarding Innovations and Best Practices which the university would like to include.