2.2.1. Describe Processes followed to improve quality of Teaching & Learning (15)

Some of the processes / initiatives that have been put in place for improving the Quality of teaching and learning are as follows.

(i) A rigorous process of selection with student and Department participation along with a Committee including External Experts has been put in place for faculty selection with MTech as the minimum requirement. All the Faculty members are encouraged to pursue PhD programme if they are not PhDs and take up some research project if they are already PhDs. This is evident from the large number of research projects pursued in the Departments.

(ii) A rigorous continuous evaluation process keeps the students engaged in daily learning and with continuous feedback. A special unique feature of this process is the administration of the Daily Home Assignment (DHA) that is given at the end of every lecture in a theory course and enables the student to "think" and assimilate the material delivered in the lecture of the day. These are to be submitted in the next class and evaluated and returned in the subsequent class. This is continuous learning and evaluation in the truest spirit of the term.

(iii) Teaching-Learning in DEI follows a student-centric process employing experiential, participative, problem solving and constructivist methodologies, through (a) Teaching Methodology, (b) Experience-Based Courses, (c) Different Modes of learner-centered teaching (d) a wide range of co-scholastic components and (e) Specialized Centres of Learning.

(a) Experiential and Participatory Teaching-Learning methods used include:
- Seminar cum Group Discussions
- Individual and Group Projects
- Self-Study and Dissertations
- Field work
- Case Analysis
- Presentations
- Term Papers
- Self-Study Courses
- Research Colloquia

(b) Experience-based/ Practice-oriented courses

Based on the principle of 'Learning by Doing' a large proportion of courses in each programme have a high practical component to provide hands on learning experience to the students:

- Multiple projects in II year, III year and IV year BTech.
- Work-Based training

- Compulsory Summer Training after BTech I year (30 days) and II year (40 days)
- Compulsory Co-operative Industrial Internship after BTech III Year (5 months)
- Performing Arts Courses
- Vocational and Skill courses
- Rural Development Core course with focus on Agricultural Operations

(c) Learner-Centred Modes of Education

Learner-Centred modes of teaching-learning are used that make learning self-paced and self-regulated:

- **Vidyaprasar** (www.vidyaprasar.dei.ac.in), an **on-line collaborative learning, live web cast and content management system** with state-of-the-art interactive learning resources. MOOCS developed by DEI and under e-PG-Pathshala and SWAYAM.
- Ten Virtual and Remote Triggered Laboratories
- Specialization streams are available for the student to choose within the Core Branch. BTech (Electrical Engineering) student can choose to specialize in Electronics or Computer Science or stay in the core discipline. The success of this approach is borne by the fact that BTech (Electrical Engineering) students have been appearing in the GATE exam in all the three disciplines i.e. Electrical Engineering, Electronics and Communications Engineering and Computer Science and scoring very high percentile marks in all the three disciplines enabling them to join PG programmes in IISc and various IITs.
- Variety of Elective courses

(d) Co-Scholastic Learning Components

A wide range of compulsory co-scholastic learning components cater to varied learner interests and potentialities that include co-curricular activities, games and sports, yoga, community outreach, field and industrial visits, creative and problem-solving contests and Field and Industry experience. A Business Advisory Clinic provides free consultancy to Business firms and Industries facing difficulties. Faculty members and students take up real life case studies and offer appropriate guidance. More than 6,000 cases have been taken up and resolved satisfactorily.

(e) Specialized Centres of Learning

The advanced centres of learning include:

- Multi-disciplinary Quantum and Nano Systems and the Consciousness Studies Virtual Centers

- The Virtual Advanced Lab for Interactive Design, Analyze, and Test in Electronics – eVALIDATE.
- The iNFORMATION- cOMMUNICATION- nEURO- cOGNITIVE- Technologies Assisted Language Lab (I-c-n-c-TALL)
- 2G to 5G, IOT, AI and Robotics Laboratories
- Quantum Jugaad Centre and Entrepreneurship and Virtual Incubation Centre

The above teaching learning modalities ensure experiential and participatory learning leading to a holistic development of students within and beyond the classroom.

(iv) The curriculum has the following compulsory core courses in all UG programmes specially focused on the development of human values and professional ethics:
- Cultural Education (to take pride in national ethos so that one may not lose one's moorings).
- Scientific Methodology, General Knowledge and Current Affairs: (to nurture a scientific temper and be aware of contemporary developments).
- Rural Development: (to foster a fuller understanding of the rural life with a view to appreciate properly the polity and economy of our country and social forces at work).
- Agricultural Operations (to inculcate a spirit of working with one's own hands and develop an understanding of the contribution of rural life)
- Social Service: (to engender the spirit of brotherhood of man and to facilitate establishment of casteless and classless society).
- Comparative Study of Religion: (to create a spirit of tolerance and awaken the spirit of Brotherhood of Man and Fatherhood of God).
- Co-curricular Activities (for all-round development of personality)
- Environment Studies (for environment consciousness and its impact on everyday life)

(v) Special measures taken to support relatively slow learners, are:
- Organizing Extra Classes
- Remedial and Tutorial Classes are held to prepare them for remedial exams
- Assistance from classmates and senior students is arranged
- Providing tutorial assignments
- Providing lectures uploaded on web and extra reading material to improve basic understanding of subject
- Encouraging students to study courses on developing soft skills to master understanding of language
- Encouraging students to participate in various Co-Curricular and Extra-Curricular activities to develop social skills

(vi)   The Institute offers a number of opportunities for advanced learners to augment their talent and meet their learning needs:

- Under-Graduate Research Awards (UGRA): to encourage select bright UG students to undertake research projects.
- Students are encouraged to make research contributions in their major project at the PG level and publish their results in journals and also present it at National and International Conferences.
- Students are encouraged to participate in Summer Research Fellowship programmes at prestigious research institutes and laboratories in India and abroad.
- The Institute, in collaboration with the Systems Society of India, organizes various competitions and an Annual Students' Systems Conference (Paritantra) and Technical Colloquia regularly and gives prizes and awards.
- Vertical and Horizontal Progression: Provision has been made for bright students to undertake advance credit courses and integrated degree programs.
- MoUs and Collaboration: Students are encouraged to work in laboratories of National and International Institutes and Universities with MoU.
- Financial support is provided to students for participation in National and International Conferences.
- The Institute, in association with Association of Alumni and Friends of DEI (AAFDEI) registered in USA, provides financial support for boarding and lodging and travel assistance to students on their visit abroad for higher studies or for conferences.
- Earn while you learn provision has been made for students for part-time jobs in the large number of projects running in the Institute. This helps them learn state of the art techniques and also get remuneration. Students are encouraged to help slow learners in their class and in junior classes.