Innovations by the Faculty in Teaching and Learning

The Innovative Tools used by the Faculty in Teaching and Learning Process in addition to the conventional methods like, Blackboard teaching, sharing learning materials and questioning in every class:

a) **ICT and Multimedia based Learning:** Each classroom is equipped with overhead projectors and audio system. One classroom equipped with the state of-the-art smart boards in the department and each department possessing one smart classroom which is shared on need base. Textbooks, reference books, and study notes prepared by teachers are used for instruction. Other instruction tools are whiteboard, charts and diagrams and laboratory demonstration models.

a) **Hardware Demonstrative Tools:** Apart from the experimental set-ups, the labs of the Electrical Engineering Department are equipped with different cut-section and demonstration models (Electrical Machines Lab, Thermal Power Engineering Lab, Basic Electrical Engineering Lab, Power System Lab) and working models for the effective teaching-learning process. In addition, physical demonstration of hardware models in classroom for better understanding and visualization is practiced by teachers. A Wind Solar Hybrid Power Plant in-house is installed in the lab, respective teacher demonstrates Non-conventional Energy concepts with dedicated Data Logger which provides data for further analysis and understanding.

b) **Software Simulation Tools:** Software simulation tools are used by faculty for better understanding of concepts by analysis through simulation models in software such as PSIM, Circuit Maker, MATLAB Simulink, LTSpice, ETAP.

c) **Video Lectures:** Educational videos have become an important part of higher education that provides an important content-delivery tool. From these videos students easily understand the concepts and operations of different systems. Video lectures are especially useful for the teachers. Using the recording of the lecture, the teacher can take a look at his presenting skills to find out the scope of improvement.

d) **Google Classroom:** Google Classroom is a free suite with many features and productivity tools that includes email, documents, storage and easy communication means. A faculty uses Classroom to keep students updated with lecture materials, notes, links and laboratory manuals, question bank etc which the students may access anytime. The faculty allots the assignments, collects and evaluates them in the platform itself.

e) **G Meet:** G Meet is a free suite for anyone with a Google account can create a video class and record the lectures to re-watch and reviewing the learning objective after the class.

f) **Quiz:** A quiz can function throughout a course as an informative feedback device allowing both the instructor and the students to see where they are excelling or need more focus.

g) **Digital Library:** Digital library section is fostered in the Knowledge Centre to facilitate for improving learner's body of knowledge and academic excellence. The faculty shares knowledge through access to ACM Digital library, J-Gate, British Council Library where more than 85,000 e-books and 7,000 e-journals are accessible from college library.

h) **E-Learning Resources**: The Videos and E-learning materials are circulated by the course in charges to the students that helps in providing exposure to domain expertise of the faculty members from various reputed institutes like NPTEL, Coursera, Internshala. The main objective of the National Program on Technology Enhanced Learning (NPTEL) is to enhance the quality of engineering and science education across the country by developing contents for undergraduate and postgraduate curriculum using video and web-based courses. These courses cover the syllabi prescribed by universities and approved by AICTE. RCCIIT is having NPTEL Local Chapter. It is a partnership between the college and NPTEL.

i) **Technical Writing**: Efficient technical writing by an engineer increases effectiveness in communication. The faculty assigns different technical report writing topics to students to make

them conversant to domain knowledge and enhance the writing skills. Students are encouraged to write in college magazine and departmental technical magazines.

j) **Presentations**: Seminars are a vital part of academic courses that gives an opportunity to develop essential skills and understanding of the subject.

k) **Project Based Learning:** Project based learning structures in curriculum tends to encourage students around discrete projects with presentation that includes multi-step problem solving, research, logical deduction, iterative learning and also encourage teamwork. Mini projects are allotted to students for developing better understanding of concepts.

l) **Tutorial:** Learning through problem solving enhances the subject knowledge apart from the theoretical concepts. The students are offered with special concept-oriented class for core subjects. Tutorial problems and other problem solving is conducted in such classes in order to prepare for enhancing skills to compete in competitive exams.

m) **Flip teaching:** A flipped class (view image) is one that inverts the typical cycle of content acquisition and application so that:
students gain necessary knowledge before class, and instructors guide students to actively and interactively clarify and apply that knowledge during class.
Like the best classes have always done, this approach supports instructors playing their most important role of guiding their students to deeper thinking and higher levels of application. A flipped class keeps student learning at the centre of teaching.

n) **Student Workshops**: Student workshops are conducted by faculty members to enhance subject knowledge through special lecture sessions as well as Hands-On sessions. The hands-on sessions are based on modelling, analysis, simulation and hardware for practical knowledge development.

o) **Industrial Visits:** Industrial visits are conducted to by department where specific faculty accompany the students. The students get some insight into the real industrial usage of theoretical concepts that are taught in curriculum.
