DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

Innovations by the Faculty in Teaching and Learning

Innovative teaching methodologies help faculty to deliver their lectures in a faster and efficient manner thereby allowing the students to keep abreast of technological advancements. In addition, innovative teaching aids also impart rationale thinking and self-sufficient thought process in the mindsets of students by making them more proactive. Few of the innovative teaching techniques adopted in the department are briefly tabulated below:

S. No	Teaching Methods	Mode of Teaching	Description
1.	Multimedia Learning	ICT Class rooms	Use of visual teaching aids like LCD projectors help students understand lectures more easily and develop presentation abilities.
2.	Collaborative Learning	Activity classes	Collaborative learning is encouraged among group of students to enrich their knowledge levels relevant to emerging technologies in order to bridge the industry- academia gaps.
3.	Encouraging Bright Students	MOOC's based Learning	Advanced learners are encouraged to take up various certificate courses and present papers in conferences/journals. Institutional Entrepreneurship Development Cell (EDC) is set up to encourage the advanced learners to take up entrepreneurship. Advanced learners are encouraged to attend lectures/Workshops (on advanced topics) outside the campus to enrich their knowledge levels.
4.	Support to Slow Learners	Make up Classes	Make up Classes are conducted for slow learning students. In each subject the concerned faculty member elaborately explains a few important topics and trains them for the end examinations.
5.	Improving learning abilities	Assignments	Students are encouraged to submit subject wise assignments to enhance their readable skills and learning abilities.
6.	Interactive Learning	Tutorial classes	Tutorial class is a concept of constructive learning where students are provided with

			course material in advance. Two faculty of respective subject drive student to give seminars, solve complex problems and participate collaboratively in various quizzes.
7.	Additional Curriculum Based Learning	Additional labs	To enhance the coding skills and practical learning abilities –additional laboratory practices relevant to industrial applications are introduced.
8.	Co-Curricular Activities	Extra activities	Students are encouraged to take part in different co-curricular activities like Motivational Talks by eminent personalities, NSS activities, Career Guidance Programs by skilled trainers from industry.
9.	Industrial Stream lined Learning	Industrial visits	Students are encouraged to visit local industries in order to expose them to the industrial practices under use.
10.	Professional Learning practices	Guest Lectures	Eminent personalities from IITs, NITs & other industrial representatives are invited to educate the students about latest technological advancements.

The above listed out innovative teaching and learning techniques are detailed as under:

1. Multimedia Learning:

Introduction:

In this, the teacher will deliver some concepts with the aid of LCD projectors and OHP slides. PPTs can be used as a tool for teachers to create visually content rich presentations with multimedia. The students can identify the key points of presentation and help them to organize their thinking process. PowerPoint can be an effective tool to present material in classroom and encourage student learning. With this ICT classes the student can pay more attention towards the classes. It, in turn benefits the faculty to discuss the main topics in the limited time.

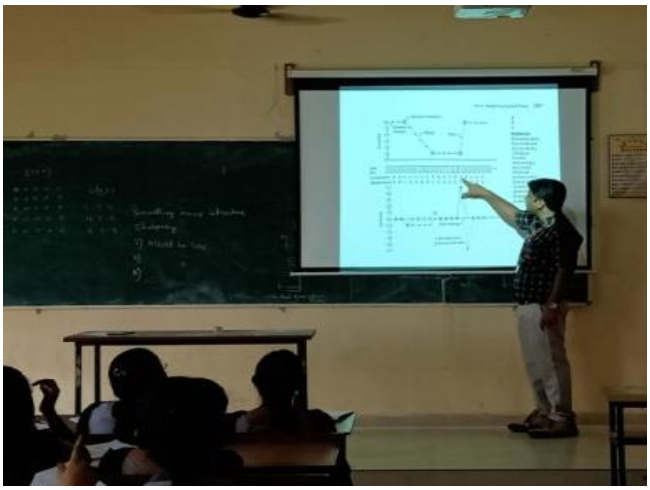
Execution Plan:

The concerned subject faculty explains some topics using PowerPoint Presentations/ Animation Videos in their concerned subject hours.

Expected Outcomes/ Impact Analysis:

1. It’s easier to understand the points from presentations than from black board lecture.
2. Student is able to understand the basic concepts of developments.

3. This method makes the subject easier.
4. The ICT classroom increases the knowledge and understanding of the course area by visualizing the applications also.




2. Collaborative Learning

Introduction:

Groups of students are encouraged to develop various mini projects in advanced knowledge domains like IoT and Embedded systems. Students of other peer branches are encouraged to collaboratively work on Inter Departmental Projects. As a part of enhancing the collaborative learning skills, project expos are conducted on various student platforms such as CSI, IEI and IETE. As a part of encouraging students towards exploring their new ideas and transform them to prototype models, management of LENDI is funding few Projects every academic year.

Execution Plan:

The students are formed into groups and assigned to some faculty members based on the corresponding working discipline and then they are encouraged to do different projects. The projects are displayed in different project expos conducted under different professional bodies like IEI, IETE and CSI. They are also encouraged to attend competitions conducted by NIT's and IIT's.

Expected Outcomes/ Impact Analysis:

1. The impact of collaborative learning adopted is helpful to enrich the knowledge potentials of Students and to explore their innovative ideas.

2. Documenting, drafting abilities and presentation skills of students are improved.

3. Technical skills and team work abilities of students are enhanced.

4. Social responsibilities of students are exhibited through implementation and deployment of Socially relevant projects.

Professional Society Membership:

The Membership emphasizes on the development of leadership qualities, technical qualities and Professional qualities of students as well as faculty. It establishes a network of contacts in the chosen field in honing very rudimentary skills like communication, leadership, teamwork and self-management skills.

The department has 3 professional chapters, which are named as IEEE, IE India and IETE. Under the vicinity of these chapters various activities are conducted such as Project Expos, Seminars and Guest Lectures etc. These chapters enchance the technical and leadership qualities among the students and faculty.

S.No	Name of the Professional Societies	Academic year	No. of Guest lecturers/ workshops conducted
1	Institute of Engineers (IE) Chapter	2018-19	5
		2017-18	2
		2016-17	5
2	Institute of Electronics and Telecommunication Engineers [IETE]	2018-19	5
		2017-18	2
		2016-17	4
3	Institute of Electrical and Electronics Engineers (IEEE) Student Branch	2018-19	1

Sample copies of expert lectures conducted

Summary of Mini Projects developed under these Professional Chapters:

SNo.	Academic Year	Number of Mini projects developed	Total number of Students involved
1.	2018-19	26	95
2.	2017-18	18	57
3.	2016-17	15	45

Sample Copies of Mini Projects:

- **AP Electrothon an initiative of APITA and International Institute of Digital Technologies conducted competition, our LIET students stood third among the 40 teams participated and were awarded the cash prize of Rs.50,000/- for third prize and Rs.10000/-for being meritorious in the zonal level competition**

3. Encouraging Bright Students:

Introduction:

Advanced Learners are encouraged to take up various certificate courses, take up choice baesd projects and presen papers in conferences/ journals. Interested students and faculty are encouraged to register for the NPTEL program/ online certification courses of their own areas of teaching and research interests, for enhancing their teaching skills and smooth conduct of the teaching process in the regular class room teaching and for understanding the potential concepts much effectively.

Faculty members are also made as mentors for providing support for the students to complete the course. Similarly, the students who have not registered for any courses are supported by providing the NPTEL video lectures in the central digital library and a data bank of the CDs of all the NPTEL courses that are available in the department library.

Students with ideas towards Entrepreneurship are encouraged by the Institutional Entrepreneurship Development Cell (EDC) to present their ideas among different programs organized outside the college and also some workshops, conducted to develop their ideas

and to become an Entrepreneur. Advanced learners are encouraged to attend lectures/workshops (on advanced topics) outside the campus to enrich their knowledge levels.

Execution Plan:

The students who have enrolled for different certification courses can use the infrastructure available in the department/institution even after the college timings for completing their course and some faculty are also allotted for supporting them.

Training programs and personality development programs are conducted by Entrepreneurship Development Cell (EDC) for students in the college premises.

Expected outcomes / Impact Analysis:

It helps to enrich the knowledge potentials of students and enhance their employability skills.

A sample certificate copy relevant to a one week workshop (on PLC's) conducted by Siemens

This is to certify that ***BONTHA SREE VIDHYA*** .....

bearing number..... ***DSL/APSSDC/10808*** ..... has successfully

completed..... ***Basic of Process Instrumentation*** ..... Course

Conducted at

Andhra University College of Engineering (A), Visakhapatnam

from ***23-07-2018*** to ***28-07-2018***

Authorized Signatory:	Authorized Signatory:	Authorized Signatory:
Siemens Industry Software Pvt. Ltd	APSSDC	DesignTech Systems Limited

- **Skill Development Training Programs for Students**

2018-19

S.no	Number of Students	Batch	Program	Duration	Organization
1	22	3rd Year	IoT Program	12/12/2018 to 24/12/2018 (2 Weeks)	LIET in association with Andhra Pradesh State Skill Development Corporation (APSSDC)
2	23	3rd Year	Phython	28/11/2018 to 25/12/2018 (2 Weeks)	LIET in association with Andhra Pradesh State Skill Development Corporation (APSSDC)
3	41	2nd Year	Phython	15/12/2018 to 28/12/2018 (2 Weeks)	LIET in association with Andhra Pradesh State Skill Development Corporation (APSSDC)

4	24	3rd Year	5G Communication ",Carrers in Technology" &"Women In Engineering	21-07-18	LIET
5	24	3rd Year	SIMENS Workshop Instrumentation	23-07-2018 to 28-07-2018 (1 week)	Andra University Vizag

2017-18

S.No	Number of Students	Batch	Program	Duration	Organization
1	19	2nd Year	PHYTHON	07/05/2018 to 24/05/2018 (2 Weeks)	LIET in association with Andhra Pradesh State Skill Development Corporation (APSSDC)

Table: List of skill development training programs for Students

4. Support to Slow Learners

Introduction:

Weak students are identified based on the performances in classroom, in the midterm tests and university result analysis. The ultimate aim of remedial teaching is to help students who have fallen behind to learn to the best of their ability and to bring them back into the mainstream classes as far as possible.

Execution Plan:

Following steps are taken to enrich their knowledge levels:

- Subject based remedial classes are conducted for weak students.
- Subject relevant Course material and question banks are provided for slow learners to understand the subjects easily.
- Progress reports are dispatched to parents and keep them informed about schedule of remedial classes.
- To enhance the practical abilities, separate lab sessions are conducted beyond the college hours.

Expected outcomes/ Impact Analysis:

The weak students can improve their academic performances that lead to an improvement in the average performance of the class.

5. Improving learning abilities:

Introduction:

Unit-wise assignment questions are prepared and submitted to PAC for analyzing the quality of questions. Further assignment questions are given to the students to test the attainment of specified course outcomes.

Execution Plan:

The teacher provides the students with an assignment and the students submit the assignment answers in its learning. The teacher then corrects the assignment and assesses it.

Expected outcomes/ Impact Analysis:

The impact of the quality initiatives improves the student's knowledge to attain better performances and to enhance the readable skills and learning abilities.

6. Interactive Learning:

Introduction:

Subject wise tutorial classes are conducted (every week) to clear the doubts of students under the guidance of two faculty members in each subject. Students are made to work out complex exercise problems in order to understand the subject matter. Some class tests are conducted in the concerned subjects as per the given schedule to categorize the performance of the students.

GATE syllabus oriented assignment questions and quizzes are prepared for students to prepare them for various national level competitive examinations.

Active participation of students in classroom environment is encouraged through group discussions, problem solving exercises and encouraging questionnaire sessions.

Execution Plan:

1.Students are given the learning material of the topic to be covered before 2 days for their preparation.

2.On the day of implementation of activity two faculty attend the class and make students solve problems.

3.In some classes the students are asked to give seminars on the given topics also students are made into teams and quizzes are conducted.

Expected outcomes/ Impact Analysis:

1. Students can express their views and share knowledge.
2. It's an interactive session and team work.
3. Students can gain more knowledge and improves the critical thinking on the concept.

Maintenance of Quality of Course files:

Every faculty prepares the course file before the classwork commencing. A detailed course file is prepared with following contents. So that the faculty can deliver the best way of presentation and student can easily understand the topics in a relevant subject

S.NO	Description
1	Course Syllabus
2	Course Information Sheet
3	Course Outcomes-Assessment Methodology/ Plan Sheet
4	Model Lesson Plan
5	Lecture Notes (Unit Wise)
6	Unit wise-Question Bank
7	Unit wise objective Questions
8	Gaps & Plans
9	Contents beyond the syllabus
10	Assignment Topics
11	Internal Question Papers with Scripts
12	University Question Papers
13	Result Analysis
14	CO Attainments
15	Makeup & Remedial Classes
16	Registers

7. Additional Curriculum Based Learning:

The department of ECE incorporated additional courses in the time-table apart from the curriculum to enrich the students with the technological advancements on par with the industrial requirements. Learning a new skill will broaden the opportunities at the same time empower one as an individual. Additional laboratories are acknowledged as the preferred method of instruction for development of research skills. These are some of the additional labs introduced:

- Data Structures Lab for II year 1st semester students.
- Embedded Systems Lab for II year 2nd semester students.
- IOT Lab and Project lab for III and IV Year Students.

Execution Plan:

Hours for Additional Labs are allocated in the Time Table. Faculty are allotted to these labs and during the initial lab hours students are provided with the theory classes followed by the practical labs in advanced domains like Embedded systems. The students are encouraged to do a few mini projects in their respective domains.

Expected Outcomes/ Impact Analysis:

1. Students can gain more practical knowledge and improve their critical thinking.
2. Students can get knowledge on the advanced domains in the technology.

Sample Course Syllabus For Embedded Systems Lab

LIST OF EXPERIMENTS (Add on Course)	
PART-A	
S. No.	**Name of the Experiment**
1	Introduction to Embedded Systems
2	Interfacing of LED and Switches with 8051.
3	Interfacing of 7 Segment display with 8051.
4	Interfacing of Motor Driver IC(L293D) with 8051
5	Interfacing of LCD with 8051.
6	Interfacing of Keypad with 8051
7	Transmission of data from Microcontroller(8051)
8	Interfacing of Outside Peripherals with 8051(Receiving Data)
9	Generate delay using timers
10	Interfacing of ADC (Temperature Sensor) with 8051
11	Handling the Interrupts of 8051
PART-B	
Open End Experiments	
1	Develop an Application using Bluetooth Technology
2	Develop an Application using GSM Technology

8. Co-Curricular Activities:

Introduction:

Co-Curricular activities are an extension of the formal learning experiences in a course or academic program. A Co-Curricular activity essentially takes place outside a typical pen and pencil classroom experience. It gives the students an opportunity to develop particular skills and exhibit their non-academic abilities.

Execution Plan:

Students are encouraged to participate in Co-Curricular activities like paper presentations, essay competitions, career development programs for improving their management skills

and leadership qualities. These are conducted inside the college and are also encouraged to participate ouside the college through different committies like NSS, Femina-wing groups. The career devloment programs by skilled trainers from industry and motivational talks by eminent personalities are also conducted for students.

Expected Outcomes / Impact Analysis:

1. Activities like participation in debates, paper presentations, essay writings, career development programs etc., help in achieving overall functioning of education.
2. Helps to develop the spirit of healthy competition.
3. These activities guide students how to organize and present an activity, how to develop skills, how to co-operate and co-ordinate in different situations-all these helps in leadership qualities.
4. Allowing students to explore strengths and talents outside of academics
5. Helping students develop stronger time-management and organizational skills.
6. Giving students the opportunity to build friendships and participate in group activities outside of the tight circle of the regular classroom.

Attached Document Proof of Classes Conducted For Personality Development and Skills Training

S.No	Subjects (Gap Identified)	Proposed Action	Date	Resource Person With Designation	Relevance to Pos
1	Personality Development Learning	Psychology Awareness Program	01-12-2018	Dr.Madhu kosuri	PO9,PO10,PO11, PO12
2	Personality Development Learning	A Session by YOUNG RESEARCHERS FORUM"	10-10-2018	NSS With Internal Faculty	PO9,PO10,PO11, PO12
3	Personality Development Learning	My Dreams an induction program	01-09-2018	Rajkumar Sabbithi Head Apps Associties	PO9,PO10,PO11, PO12

4	Personality Development Learning	The Importance at English	08-08-2018	"CHALES CHUCK PETENTLER" University of Central Missouri of Warrensburg, US	PO9,PO10,PO11, PO12
5	Personality Development Learning	EDC entrepreneurship development cell	03-07-2018	NSS With Internal Faculty	PO9,PO10,PO11, PO12

9. Industrial Stream Lined Learning:

Introduction:

Industrial visit has its own importance in the career of a student who is pursuing a professional degree. Objectives of industrial visit are to provide students an insight regarding internal working of companies. The theoretical knowledge is not enough for making a good professional career. With an aim to go beyond academics, industrial visit provides student with a practical perspective in the field work. It provides students with an opportunity to learn practically through interaction, working methods and employment practices.

Industry Internship / Summer Training of more than two weeks and post training assessment.

Internships are considered as potentially valuable tools to explore general career avenues by the students. Such arrangements can provide them with valuable work experience (both practical and for résumé enhancement) and an opportunity to line up a job before graduation. In addition to securing good work experience, students are able to gain academic credit and financial support.

Execution Plan:

The department organizes industrial visits for students once in a year/semester to relevant local organizations/companies to enable the students to experience the practical implementation of theoretical knowledge in real world. One day industrial visit facility is provided by the department to the students along with the faculty coordinators.

Industrial visit coordinator of the department communicates with industry and allocates slots for

industrial visits.

The department encourages the students to do internships in summer holidays every year.

Expected Outcomes/ Impact Analysis:

1. These visits help the students to learn about people management, by providing them with an insight into the real working environment of the Industry with practical manner.

2. The Internship program provides hands-on work experience from day one, providing students with an opportunity to work directly with inspiring and experienced professionals.

4. The insights and skills gained by the end of the program would be invaluable for future careers.

5. Facilitates to understand the dos and don'ts of the industrial practice

6. It helps the students to gain fundamental information regarding functioning of industry.

Figure: Photo graph during industrial visit in **ALL INDIA RADIO VISHAKHAPATNAM**, for the academic year 2018-19

10. Professional Learning Practices:

Introduction:

Training sessions/Guest lectures are conducted on latest trends in technologies, latets tools for students.

Execution Plan:

The department invites experts from industry to give suggestions on improving the academic delivery. The Department Advisory Committee (DAC) in the department empanelled with eminent professors of department and university as well as leading industrialists etc. The

DAC meet frequently to discuss the need for arranging guest lecturers so as to fill the industry-academia gaps.

Expected outcomes/ Impact Analysis:

1. Helps to enhance their interpersonal skills and communications
2. Guest lecturers enable the knowledge sharing process on the recent technologies which in turn bridge the academic and industry gap.

Table: expert lecture conducted by eminent personalities

S.No	Academic Year	No. of Guest Lectures/ Workshops
1	2018-19	11
2	2017-18	4
3	2016-17	9