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DEPARTMENT BROCHURE FOR THE ACADEMIC YEAR 2015-2016 ELECTRONICS AND COMMUNICATION ENGINEERING



CVR College of Engineering was established in 2001 and its eleventh batch of students graduated from the College, this May 2015. CVR is ranked among the top few of more than 600 colleges in integrated states of AP that started in the last decade and was also rated as the #1 co-educational college in Pass percentage among nearly 300 colleges under JNTU, Hyderabad for examinations held in May 2009, November 2009 and May 2010. It is the expectation of the academic community that CVR is on the successful path to be in the TOP-5 amongst all colleges in Telangana in the next few years.

The College was the first college in Osmania University area that was promoted by NRI technology professionals resident in the US. The NRI promoters are associated with cutting-edge technologies of the computer and electronics industry. They also have strong associations with other leading NRI professionals working for world-renowned companies like IBM, Intel, Cisco, Motorola, AT&T, Lucent and Nortel who have agreed to associate with the College with a vision and passion to make the College a state-of-the-art engineering institution.

The College has been given Permanent Affiliation and Autonomous Status by JNTUH. The College received UGC autonomous status for a period of six years from 2014-15 to 2019-20.

Chairman's Message



"CVR has achieved greatest heights which no other College has achieved in a similar time frame". CVR is ranked as the #1 college among more than 600 colleges in AP that started in the last decade.

I am really excited to inform you that CVR continues to attract the best students and faculty, the key pillars of any premier educational institution. As the number of engineering colleges in AP went past 700 during 2011-12 we looked at what we have accomplished. CVR is ranked as the #1 college among more than 600 colleges in AP that started in the last decade. While we are very pleased and thrilled with the developments at CVR over the past eleven years, we are not resting on our laurels but continuing to work hard in making CVR one of the premier technical institutions in the State of Telangana. It gives me immense pleasure in informing you that CVR was ranked as the 8th best co-educational college among all colleges in Osmania University area during EAMCET-2011 counseling. It is the expectation of the academic community that CVR is on the successful path to be in the TOP-5 amongst all colleges in OU area in the next year or two.

CVR has the highest pass percentage among 300+ co-educational colleges affiliated to JNTUH for three semester examinations in a row. The students of the College garnered highest placements statewide in numerous companies of repute like ADP, Syntel, L&T, Oracle, Robert Bosch, Tally Solutions, etc., with a highest pay package of Rs. 9 Lakhs.

CVR has the unique distinction of having two former Deans of Engineering from OU and a Rector from JNTU. Most recently, CVR was rated AAA+ by Careers 360, similar to decades old institutions.

I am very happy to inform you that most of the Senior Faculty, including our Director and Principal, continue to be associated with the College. The College also has a record number of Associate Professors. We are very excited to have dedicated academicians who share our vision and passion to be part of our institution. We invite you and your parents to visit the campus of CVR College of Engineering and look at its infrastructure, learn about its faculty.

We have great promoters, best-of-class infrastructure, top-class faculty and are providing the best possible education. This is history in the making, so join us in making the CVR College of Engineering a pre-eminent technical institute in the State.

Dr. Raghava V. Cherabuddi, Chairman

Principal's Message



"Heights by great men reached and kept,
Were not attained by a sudden flight.
But they while their companions slept,
Were toiling upward in the night."

Henry Wadsworth Longfellow

The meaning of the above stanza is self-evident. Nothing comes from nothing; nothing ever could. Success and achievements are commensurate with will power, hard work, grit and resourcefulness. The day has come when every student should realize that with globalization and immense change in the international scenario added to the recent upheavals in the world economy, the multinational companies and the corporate world have changed their outlook and methods of assessments for placing candidates in their companies. Earlier students with distinction in studies were the first to be chosen for the top jobs. Now the trends have changed and the candidates are chosen not just for good marks, but more than that they are tested for the knowledge they have retained with them.

In these days of totally urbanized atmosphere, the CVR Campus is like a breath of fresh air set amidst landscaped gardens and with a highly surcharged interactive atmosphere among students, faculties and mentors. Apart from an all encompassing academics, the College provides industry interface, performance enhancing programs, placement training and career support programs, multiple skill acquisitions, orientation and induction programs, for the deserving students. CVR conducts personality development programmes and trains students for improving their communication skills and leadership qualities.

The ideals of CVRCE is to develop technically qualified and skilled engineers who easily adapt to quick changing environments in the present world scenario.

I am delighted to express my thoughts about the departmental growth. The average passing result is excellent in the department. The department of ECE offers premier professional technical training that keeps in pace with the latest developments in the field of Electronics and Communication Engineering. It offers four year full time B.Tech program in ECE. The course is accredited by NBA. We have excellent infrastructure, highly experienced faculties and professionals associated with research work which collectively ensure dynamic and vibrant environment in the campus.

Dr. Nayanathara K Sattiraju, Principal

HOD's Message



Electronics and Communication Engineering Department of CVR College of Engineering remains at the forefront in educating and training the next generation engineers with leading edge technology. With its streamlined methodology. The Department moulds the budding professionals to make history through their positive contributions. The Department has always been the trend setter of this Institution. One of the largest and fastest growing fields of engineering, Electronics and Communication engineering covers a wide range of applications which makes our lives highly advanced, sophisticated and comfortable.

This branch of electronics had started functioning here ever since the institution came into existence in 2001 and plays an active role in this fast moving world, by way of training the students with the state of the art electronics and communication systems .The Department offers a comprehensive education, thereby preparing the students to emphasize the role of engineers in making a positive contribution to the betterment of society and human condition. The Departments' mix of practical and theoretical experiences and our commitment to academic and ethical excellence cultivate outstanding Electronics engineers who are highly sought after for both higher education and employment. We have grown into a most sought after Department in CVR College of Engineering, adding more faculty members and branching into new projects and research areas. The Department is making exhilarating progress in areas ranging from electronics, mobile and wireless communication to VLSI System design. The team approach is very warm in the Department of ECE.

A palpable excitement surrounds the Department and an enthusiasm pervades every classroom and lab, invigorating our students and spurring on our faculty to fresh innovations. In an age when electronics play a major role in daily life and the promise of latest technologies coming to fruition, it is truly a great time to be a part of Electronics and Communication Engineering Department of CVR College of Engineering.

Wg Cdr Varghese Thattil (Retd) B Tech NITC, M. Tech IIT KGP(Ph.D), Head of the Department

Vision & Mission of the ECE Department

Vision:

To become a Centre of Excellence in education and research in Electronics and Communication Engineering that can serve the nation and the world.

Mission:

- To develop state-of-the-art laboratories where learning can be done by doing
- To provide the ambience to the students to become technologically competent, socially responsible and ethically conscientious professionals
- To build a team of competent teachers and researchers to pursue collaborative research to satisfy the technological needs of the community

Programmes offered by the ECE Department (2015- 16)

| | | |
|----|---|-----|
| UG | B.Tech Electronics and Communication Engineering | 240 |
| PG | M.Tech (VLSI Design) | 36 |
| | M.Tech (Embedded Systems) | 18 |
| | M.Tech (Wireless & Mobile Communications) | 18 |

Milestones:

▶ B.Tech. Programme

The department started with an intake of 60 in 2001

- ☆ Intake increased to 90 in 2002
- 120 in 2004
- 180 in 2011
- 240 in 2012
- ☆ Accredited for 3 years by the NBA in 2007
- ☆ Reaccredited for another two years from January 2013

- ▶ **M.Tech. Programme**
 - ★ M.Tech (VLSI Design) Started with intake of 18 in 2006
 - ★ M.Tech (ES) Started with intake of 18 in 2009
 - ★ M.Tech (W&MC) Started with intake of 18 in 2011
 - ★ M.Tech (VLSI Design) Intake increased to 36 in 2011
- ▶ The college was granted autonomy for three years by JNTU-H in 2011
- ▶ UGC autonomy for a period of six years from 2014-15 onwards
- ▶ Department's own course structure and syllabus initiated from the batch of 2011 onwards
- ▶ Choice Based Credit System (CBCS) based Course structure commenced from 2015-16 batch onwards

Departmental Highlights

Centre for VLSI design with Cadence tools was established in 2003 in the name of Prof. Magdy A. Bayoumi, Fellow IEEE, University of Louisiana, USA.



Chairman with Prof. Magdy A. Bayoumi

- ★ Full fledged design suite for semi custom and full custom design
- ★ Xilinx based design suite for FPGA prototyping
- ★ M.Tech and B.Tech projects up to GDSII/OA using Cadence tools
- ★ Organization Life Membership of the IETE was obtained in 2010
- ★ Department has received Rs 10,80,000 from AICTE under MODROBS scheme for the modernization of Communication lab
- ★ Department received 3 DRDO projects worth Rs 27 lakhs with Prof. Sengupta as the Principal Investigator

★ Department is actively involved in the development of Unmanned Aerial Vehicles (UAVs) with Dr. P. Subramanyam as the principal investigator. The project provides a centralized platform for providing a collaborative research and development environment with faculty and students. College has invested an amount of Rs 6.5 lakhs into this project.

Facilities

Infrastructural Facilities

| | | | |
|---|------------------------------|---|-----|
| ❖ | No. of class Rooms | : | 16 |
| ❖ | No. of Tutorial Rooms | : | 04 |
| ❖ | No. of Faculty Rooms | : | 16 |
| ❖ | No. of labs for UG Programme | : | 11 |
| ❖ | No. of Labs for PG Programme | : | 06 |
| ❖ | Department Library | : | 01 |
| ❖ | No. of Seminar Halls | : | 01 |
| ❖ | No. of Computers | : | 320 |
| ❖ | No. of Printers | : | 16 |

Computational Facilities

| S No | Location | No of Systems |
|------|--------------------------|---------------|
| 1 | ECA & ECAD Lab | 74 |
| 2 | MP& MC Lab | 67 |
| 3 | VLSI Lab | 65 |
| 4 | DSP/Basic Simulation lab | 35 |
| 5. | ES, WMC & Research Labs | 54 |
| 6. | Faculty Systems | 25 |
| | Total number of Systems | 320 |

Brief Profiles of Professors / Achievements

- **Dr. K. Lal Kishore:** Ph.D. from IISC Bengaluru. He recently retired from the post of Vice Chancellor of JNTU Anantapur. He served JNTU Hyderabad in various positions as Director, Principal, Rector & Registrar for 12 years.
- **Dr. Nayanathara KS:** Principal, CVR College of Engineering, An Executive member, IETE, Ph.D. from NIT Warangal and an expert in Electromagnetics and Microwave Engineering
- **Prof. S Sengupta:** Former Executive Director, ECIL; National Design Award Winner, Director-Projects, he has been awarded three DRDO Projects
- **WgCdr Varghese Thattil:** Head of the Department of ECE and Specialist in Defense Communications.
- **Dr. P. Subrahmanyam:** Former Professor of the Osmania University former Secretary, Instrument Society of India. UAV project coordinator.
- **Prof. C Venkat Rao:** Former Scientist F, DLRL, former Principal of an Engineering College affiliated to JNTU-H
- **Dr. Rajarshi Mahapatra:** Ph.D. from IIT, Kharagpur & Postdoc. in CEA-LETI, France. He served as a member of TPC for several national & International Conferences & Peer viewed several journals in the area of Wireless networks.
- **Dr. T. Esther Rani:** Ph.D. from JNTU in Low Power VLSI Design. Received UGC Research Award for a period of 2 years with full salary benefits and Research grant of Rs. 3 Lakhs.
- **Dr. Humaira Nishat:** Ph.D. from JNTUH and expert in Wireless Sensor Networks
- **Prof. P. Viswanath:** Former Executive Director of ECIL. He has 36 years of industrial experience in the field of Instrumentation & Control, specialized in nuclear power plants.
- **Dr. K. Lalithendra:** Ph.D. from IIT Delhi in Microwave Engineering. He is an expert in Electromagnetics & Transmission Lines, Antennas & solid state devices.

OUR TEAM:

| Sl.No. | Photo | Name of the Faculty | Designation | Highest Qualification | No of Publications |
|--------|-------|---------------------|-------------|-----------------------|--------------------|
|--------|-------|---------------------|-------------|-----------------------|--------------------|

Program: B.Tech ECE

| | | | | | |
|---|---|---------------------|-----------------------|---------|-------|
| 1 |  | Prof. C. Venkat Rao | Emeritus Professor | M.Tech. | ..... |
| 2 |  | Dr. P. Subrahmanyam | Emeritus Professor | Ph.D. | ..... |
| 3 |  | Dr. K. Lal Kishore | Dean R & D | Ph.D | 196 |
| 4 |  | Dr. Nayanathara K S | Professor & Principal | Ph.D. | 11 |







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|----|---|---------------------------|------------------------------|-----------------------------|-------|
| 5 |  | Prof.S.Sengupta | Professor & Dean Projects | M.Tech. | |
| 6 |  | WgCdr Varghese Thattil | Professor & Head | M.Tech. (Pursuing Ph.D.) | 8 |
| 7 |  | Prof. P.Viswanath | Professor | M.Tech. | ..... |
| 8 |  | Dr. K. Lalithendra | Professor | Ph.D | 9 |
| 9 |  | Mr. G. Ravi Shankar Reddy | Associate Professor | M.E. (Pursuing Ph.D.) | 6 |
| 10 |  | Mr. P. Srinivasa Rao | Associate Professor | M.Tech. (Pursuing Ph.D.) | 6 |







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|----|---|-------------------------|---------------------|-----------------------------|-------|
| 11 |  | Mr. Karrar Hussain | Associate Professor | M.Tech. (Pursuing Ph.D.) | 5 |
| 12 |  | Mr. B. Ravinder | Associate Professor | M.S. | 4 |
| 13 |  | Mr. S.L. Narsimha Reddy | Associate Professor | M.Tech. | ..... |
| 14 |  | Mr. D. BhanuPrakash | Associate Professor | M.Tech. | 8 |
| 15 |  | Mrs. K. A. Jyotsna | Associate Professor | M.Tech. (Pursuing Ph.D.) | 1 |
| 16 |  | Mr. L. Manjunath | Associate Professor | M.Tech. | 8 |







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|----|---|------------------------|-------------------------|-----------------------------|-------|
| 17 |  | Mrs.P.Kavitha | Associate Professor | M.E. | 2 |
| 18 |  | Mrs.DhruvaR.Rinku | Associate Professor | M.Tech. (Pursuing Ph.D.) | 4 |
| 19 |  | Mr.KadaveruSrinivasulu | Associate Professor | M.Tech. | ..... |
| 20 |  | Mr. Shakeel Ahmed | Sr. Assistant Professor | M.Tech. | 5 |
| 21 |  | Mr.M.Ashok | Sr. Assistant Professor | M.Tech. | |
| 22 |  | Mrs.AthiraG.Krishna | Sr. Assistant Professor | M.Tech. | 2 |







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|----|---|--------------------|---------------------|-----------------------------|----|
| 23 |  | Mrs.A.Anitha | Assistant Professor | M.Tech. | 2 |
| 24 |  | Mrs.M.V.Sushumna | Assistant Professor | M.Tech. | 2 |
| 25 |  | Mr.R.Prakash Kumar | Assistant Professor | M.Tech. | 5 |
| 26 |  | Mr.K.Bapayya | Assistant Professor | M.Tech. | 12 |
| 27 |  | Mr.B.JanardhanaRao | Assistant Professor | M.Tech. (Pursuing Ph.D.) | 13 |
| 28 |  | Mrs. A. Malleswari | Assistant Professor | M.Tech. (Pursuing Ph.D.) | 1 |

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|----|---|-------------------------|---------------------|----------|-------|
| 30 |  | Mr. S Ravi Kanth | Assistant Professor | M.Tech. | |
| 31 |  | Mr. Shankar B | Assistant Professor | M.Tech. | |
| 32 |  | Mr. M.Vinod Kumar Reddy | Assistant Professor | M.Tech. | 7 |
| 33 |  | Mr. K.SureshRaju | Assistant Professor | M.Tech. | 2 |
| 34 |  | Mr. S. Naveen Kumar | Assistant Professor | M. Tech. | 5 |
| 35 |  | Mr. Jail Singh | Assistant Professor | M.Tech. | 2 |


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|----|---|---------------------------|---------------------|---------|-------|
| 36 |  | Mrs. T. Subha Sri Lakshmi | Assistant Professor | M.Tech. | 4 |
| 37 |  | Mrs. M. Santhoshi | Assistant Professor | M.Tech. | 1 |
| 38 |  | Mrs. G. Swapna Sri | Assistant Professor | M.Tech. | ..... |
| 39 |  | Mr. P. Sreekanth | Assistant Professor | M.Tech. | 2 |
| 40 |  | Ms. Shakira Begum Shaik | Assistant Professor | M.Tech. | 1 |
| 41 |  | Mrs. Aditi Kohli | Assistant Professor | M.Tech. | 3 |

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|----|---|------------------------|---------------------|-----------------------------|-------|
| 42 |  | Mrs.V.Rama Devi | Assistant Professor | M.Tech. (Pursuing Ph.D.) | 1 |
| 43 |  | Mr.G. Ravi Kumar Reddy | Assistant Professor | M.Tech. | |
| 44 |  | Mr. K. Arun Kumar | Assistant Professor | M.Tech. | 7 |
| 45 |  | Mr.N.Naresh Kumar | Assistant Professor | M.Tech. | ..... |
| 46 |  | Mr.Meer Mehaboob Ali | Assistant Professor | M.Tech. | |
| 47 |  | Mr.G. BalaRaju | Assistant Professor | M.Tech. | |

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|----|---|----------------------|---------------------|---------|-------|
| 48 |  | Mr. G.Santhosh Kumar | Assistant Professor | M.Tech. | 8 |
| 49 |  | Mrs. S. Swetha | Assistant Professor | M.Tech. | 2 |
| 50 |  | Ms.Ch. Usharani | Assistant Professor | M.Tech. | ..... |
| 51 |  | Mrs.G.Snehalatha | Assistant Professor | M.Tech. | ..... |
| 52 |  | Mr.Prathap Soma | Assistant Professor | M.Tech. | 1 |
| 53 |  | Ms.Rajeshwari Soma | Assistant Professor | M.Tech. | 1 |

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|--|---|-----------------------|-------------------------|---------|-------|
| 54 |  | Mrs.B.Jayasri | Assistant Professor | M.Tech. | 1 |
| 55 |  | Mrs.R.Prameela Devi | Assistant Professor | M.Tech. | |
| 56 |  | Mr.P.Rajashekar Reddy | Assistant Professor | M.Tech. | ..... |
| 57 |  | Mr.Sharath Chandra | Assistant Professor | M.Tech. | ..... |
| PG Programme: M.Tech. (VLSI Design) | | | | | |
| 58 |  | Dr.T.EstherRani | Professor | Ph.D. | 11 |
| 59 |  | Mr.R.Ganesh | Sr. Assistant Professor | M.Tech. | 9 |

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|---|---|-----------------------|---------------------|-----------------------------|-------|
| 60 |  | Mrs.V.SilpaKesav | Assistant Professor | M.Tech. (Pursuing Ph.D.) | 2 |
| 61 |  | Mrs. K.Venkatalaxmi | Assistant Professor | M.E. | |
| 62 |  | Mrs. Ch. Hemalatha | Assistant Professor | M.Tech. | 1 |
| 63 |  | Mrs. G. VijayaNirmala | Assistant Professor | M.Tech. | ..... |
| PG Programme: M.Tech. (Embedded Systems) | | | | | |
| 64 |  | Dr. RajarshiMahapatra | Professor | Ph.D. | 50 |
| 65 |  | Mrs.S. Sailaja | Assistant Professor | M.Tech. | 1 |

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|--|---|-------------------|-------------------------|-----------------------------|-------|
| 66 |  | Mrs. T.Sravanthi | Assistant Professor | M.Tech. (Pursuing Ph.D.) | 4 |
| PG Programme: M.Tech (Wireless & Mobile Communications) | | | | | |
| 67 |  | Dr.Humaira Nishat | Professor | Ph.D. | 18 |
| 68 |  | Mrs.T. Padmavathi | Sr. Assistant Professor | M.Tech. | 2 |
| 69 |  | Mr. M. Srinivas | Assistant Professor | M.Tech. | ..... |

Awards Given to the Students:

- Late Sri. M. Madan Mohan Gold Medal for the student scoring the highest aggregate in B.Tech in ECE Branch
 Ms. Bhattiprolu Swathi 09B81A04A1
- Cash Award for the best B.Tech. Project in the subject of VLSI Design in memory of Late Prof. RVB Chary of the College (To be shared among the project group members).
 Mr.B.Manoj 09B81A0440
 Mr. D Nagarjuna 09B81A0443
 Mr. G Prashanth Kumar 09B81A0456

3. Cash Award for the best B.Tech Project in each of the branches (To be shared by the members of the project group).

| | |
|-------------------|------------|
| Mr. T. Ravi Kumar | 09B81A0469 |
| Mr. B Sairam | 09B81A0479 |
| Mr. T Teja Reddy | 09B81A04A5 |
4. Cash Awards to the Toppers of each branch other than those who won Gold Medals

| | |
|-----------------------------|------------|
| Ms. Verriseti Bindu Madhavi | 09B81A0417 |
|-----------------------------|------------|
5. Late Prof. P. Narsimha Reddy Gold Medal for the best Girl Student scoring highest aggregate marks in B.Tech among all branches.

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|--------------------|------------|
| Ms. Palla Sindhuja | 10B81A0491 |
|--------------------|------------|
6. Late Sri. M. Madan Mohan Gold Medal for the student scoring the highest aggregate in B.Tech in ECE Branch.

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|--------------------|------------|
| Ms. Palla Sindhuja | 10B81A0491 |
|--------------------|------------|
7. Cash Award for the best B.Tech Project in the Subject of VLSI Design in memory of Late Prof.RVB Chary of the College. Rs.6,000/-

| | |
|--------------------|------------|
| Ms. N Manasa Reddy | 10B81A0437 |
| Ms. K Bhavana | 10B81A0413 |
| Ms. S Aishwarya | 10B81A0426 |
8. Cash Award for the best B.Tech project in each of the branches Rs.6,000/-

| | |
|---------------------------|------------|
| Ms. Anumula Deepthi Reddy | 10B81A0417 |
|---------------------------|------------|
9. Cash award to the toppers of each branch other than those who won Gold Medals.Rs.6,000/-

| | |
|------------------------------|------------|
| Mr. L. Chaitanya Sri Krishna | 10B81A0414 |
|------------------------------|------------|

Programme Educational Objectives

Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

The B. Tech. students of Electronics and Communication Engineering program are prepared for a broad range of technical careers by achieving the following objectives:

| PEO Number | Program Educational Objectives (PEO) of Electronics and Communication Engineering |
|------------|---|
| PEO 1 | The graduates of the four year B.Tech in Electronics & Communication Engineering will be proficient in contemporary technologies. |
| PEO 2 | The graduates of the programme will imbibe human values and professional ethics to meet the needs of global industry. |
| PEO 3 | The graduates of the programme will be capable of solving complex engineering problems in core and interdisciplinary areas leading to research. |
| PEO 4 | The graduates of the programme will be able to pursue higher studies in reputed institutions. |

Programme Outcomes (POs)

Outcomes are statements that describe what students are expected to know and be able to do by the time of graduation.

On completion of the four year B.Tech program in the Electronics & Communication Engineering.

A student will be able to:

1. Apply mathematics and basic sciences in solving problems in electronics and communication systems.
2. Design and analyze analog, pulse and digital circuits to solve contemporary problems.
3. Find solutions to mitigate problems in the physical layer of the communication system.
4. Understand the performance characteristics of antennas and design for specific applications.
5. Draw on their knowledge of current software tools to design integrated circuits, processors, and communication units.
6. Utilize proficiency in handling sophisticated equipment to test, measure and control instruments.
7. Bring into play their expertise in programming to design and develop everyday appliances using microcontrollers, DSP processors and embedded systems.
8. Understand the relevance and purpose of various components and modules in the communication systems that can lead to continuous learning and research.
9. Develop leadership and group dynamics that will stand them in good stead in their chosen profession.
10. Successfully apply their understandings of financial intricacies and management mantra in launching viable enterprises.
11. Practice ethics and professionalism in all activities while keeping in mind responsibilities towards society and environment.

Course Outcomes (COs)

| Code number | Name of the Course | Course Outcomes |
|-----------------------------|---------------------|--|
| I B.Tech- I semester | | |
| 12EG101CV | English | <p>At the end of the course a student will be able to:</p> <p>CO1:At the end of the semester students would be able to identify word meaning and draw inferences for the given task</p> <p>CO2:Deduce meaning and use of familiar lexical terms and understand explicit and implicit information</p> <p>CO3:Derive conceptual meaning of words</p> <p>CO4: Would be able to write coherent, unified and complete sentences</p> |
| 12MT101CV | Mathematics-I | <p>At the end of the course a student will be able to:</p> <p>CO1:Students will achieve ability to identify, formulate and solve Engineering problems</p> <p>CO2:This will enable the students to use mathematical techniques like Transforms in Engineering problems</p> <p>CO3:Using differential equations for modeling real life situations like growth and decay and using vector calculus in EM theory etc can be mastered by studying this course</p> <p>CO4:It enables the students to confidently take competitive examinations like GATE, GRE etc;</p> |
| 12PH101CV | Engineering Physics | <p>At the end of the course a student will be able to:</p> <p>CO1:This course provides the fundamental concepts necessary for understanding the different branches of Engineering</p> <p>CO2:The fundamentals of crystallography followed by crystal defects acts as a useful beginning that helps any Engineer in understanding mechanical, magnetic, electrical properties etc of materials</p> <p>CO3:The fundamentals of semiconductor physics and semiconductor devices will be a good beginning for understanding any electronic devices</p> <p>CO4:The introduction to fiber optics and lasers would be found useful in communication engineering</p> |

| | | |
|-----------|---------------------------|---|
| 12CS101CV | Problem solving through C | <p>At the end of the course a student will be able to:</p> <p>CO1: Demonstrate the programming constructs offered by C language.</p> <p>CO2: Design a problem solution using flowcharts/ Algorithms.</p> <p>CO3: Demonstrate the logical view of memory using pointers.</p> <p>CO4: Appreciate the advantages of modular programming through functions.</p> |
| 12ME101CV | Engineering Drawing -I | <p>At the end of the course a student will be able to:</p> <p>CO1. Be able to know the construction of different types of scales like: plain, diagonal, vernie scale & learn different drawing instruments.</p> <p>CO2. Be able to interpret engineering drawings that comply with drawing standards</p> <p>CO3. Be able to draw the orthographic projections in first angle, isometric projections & projections of solids.</p> |
| 12CS131CV | Computer programming lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Draw flowcharts and write algorithms for given problems.</p> <p>CO2: Write C Programs that use functions for a given problem.</p> <p>CO3: Write C Programs that use Arrays for a given problem</p> <p>CO4: Implement Arrays using Pointers.</p> |
| 12PH131CV | Engineering Physics lab | <p>At the end of the course a student will be able to:</p> <p>CO1:At the end of the course a student will get to learn using some important instruments for measuring physical quantities, their accuracies and errors</p> <p>CO2:Some of the concepts learnt in theory are verified in the lab and it gives hands on experience</p> <p>CO3:The understanding of the students is fortified by determining the different quantities like time constant, resonant frequency etc; used by different engineers</p> <p>CO4:The experiments like lasers and optical fibers would greatly help the student in understanding their properties</p> |

| | | |
|------------------------------|--------------------------|--|
| 12ME131CV | Engineering workshop lab | <p>At the end of the course a student will be able to:</p> <p>CO1: The student will learn to do carpentry & fitting related tasks.</p> <p>CO2: Learn the basics of plumbing, machine shop & metal cutting</p> <p>CO3: The students will be motivated to do some of the household works on their own.</p> |
| I B.Tech- II semester | | |
| 12MT151CV | Mathematics-II | <p>At the end of the course a student will be able to:</p> <p>CO1: Learning numerical techniques like interpolation and numerical differentiation are helpful in Engineering applications</p> <p>CO2: A student learns Fourier series and applications which are very relevant to an Electronics Engineer</p> <p>CO3: Understanding matrix operations and Eigen values is very useful in solution of linear equations</p> <p>CO4: Understand the Curve fitting techniques, methods like Newton-Raphson method are very useful for any engineer</p> |
| 12ME151CV | Engineering Drawing - II | <p>At the end of the course a student will be able to:</p> <p>CO1: Identify, explain and draw to illustrate the purpose of different types of lines used in engineering graphics and technology.</p> <p>CO2: Explain and illustrate different sizes of lettering and numbering applications.</p> <p>CO3: Interpret the principles of visualization in first and third angle orthographic projection.</p> <p>CO4: Draw to scale the primary views of prisms and pyramids in first and third angle orthographic projection.</p> |
| 12CH151CV | Engineering Chemistry | <p>At the end of the course a student will be able to:</p> <p>CO1: The students after the course will get a clear understanding of preparation of polymers in rubber industry</p> <p>CO2: Metals used in different industries and their corrosion properties are also learnt by the student</p> <p>CO3: After studying this course a student gets an understanding of the different fuels used and their utility</p> |

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| | | CO4:After this course the student will get knowledge of procedures and regulations for safe handling and use of chemicals |
| 12CH151CV | Engineering Chemistry | At the end of the course a student will be able to: CO1:The students after the course will get a clear understanding of preparation of polymers in rubber industry CO2:Metals used in different industries and their corrosion properties are also learnt by the student CO3:After studying this course a student gets an understanding of the different fuels used and their utility CO4:After this course the student will get knowledge of procedures and regulations for safe handling and use of chemicals |
| 12EE151CV | Electrical Circuits | At the end of the course a student will be able to: CO1: Students understand the basic concepts of electrical parameters and responses of various electrical elements with different theorems. CO2: Students define various terms related to alternating circuits which are used for all household appliances and also the concept of impedance, power in ac circuits. CO3: Students can able to identify, formulate and solve Electrical engineering problems. CO4: Students can design electrical and electronics circuits and conduct experiments with electrical systems analyze and interpret data. |
| 12CS181CV | Data structures through C lab | At the end of the course a student will be able to: CO1: Write C Programs to implement sorting algorithms. CO2: Develop C programs that handle files. CO3: Implement various data structures like stacks, queues and Trees using C. CO4: Use Structures and unions in realizing various real life problems. |
| 12EG181CV | English Language Communication Skills Lab -II | At the end of the course a student will be able to: CO1: Introduction to Stress and Intonation: To help the learner speak with the right stress & tone for correct speech production. CO2: Functional English: To help students use relevant and appropriate language useful for |

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| | | <p>different situations.</p> <p>CO3: Vocabulary building: To enhance their vocabulary and enable them to use it aptly.</p> <p>CO4: Reading Comprehension: To help them improve their comprehending skills and develop reading habits.</p> |
| 12IT181CV | IT workshop lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Familiarity with MS-Office package and internet tools.</p> <p>CO2: Acquire professional skills necessary to present the artifacts by using MS-Office tools.</p> <p>CO3: Basic system administration such as installation of operating systems, trouble shooting & up gradation of system</p> |
| 12CH181CV | Engineering Chemistry lab | <p>At the end of the course a student will be able to:</p> <p>Co1:At the end of the course the student would have learnt some techniques of chemical analysis useful in environmental engineering for the civil and mechanical engineers</p> <p>Co2:Some of the techniques for estimation of say copper in brass learnt here are useful for the mechanical engineer</p> |
| I B.Tech- II semester | | |
| 12EC201CV | Electronic Devices & Circuits | <p>At the end of the course a student will be able to:</p> <p>CO1. Understand the construction and working of semiconductor junction diodes, rectifiers and others special purpose diodes and applications.</p> <p>CO2. Understand theoretically and experimentally both transistor types of BJT, FET.</p> <p>CO3. Gain knowledge about the operation of BJT & its bias configurations.</p> <p>CO 4. Describe the structure of FET. Sound knowledge of MOS transistors including types and structures and their biasing.</p> |
| 12EC203CV | Probability Theory &Stochastic Processes | <p>At the end of the course a student will be able to:</p> <p>CO1.Understand the importance of probability theory and stochastic processes in the communication system</p> <p>CO2. Understand the properties of different random and multiple random variables.</p> |

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| | | CO3. Understand the origin of noise in the communication systems and its characteristics. |
| 12EC202CV | Signals & Systems | <p>At the end of the course a student will be able to:</p> <p>CO1. To understand the concept of spectrum (line and continuous) using F.T.</p> <p>CO2. To understand and analyze the definition of convolution, and correlation.</p> <p>CO3. Understand and design basic systems for processing of audio signals, processing of digital images and communication.</p> <p>CO4. Understands the effect of linear system of signals.</p> <p>CO5. Describe analog and discrete signals and systems using computer-aided design and analysis tools (MATLAB).</p> |
| 12MT202CV | Mathematics-III | <p>At the end of the course a student will be able to:</p> <p>CO1: Students learn Bessel function, Laplace equation, bilinear transformations etc which are useful in communication engineering, digital filters, electro optics</p> <p>CO2: A student learns Complex variables thoroughly which helps him in engineering applications like fluid flow, electromagnetic etc;</p> <p>CO3: A student learns tools like numerical methods, Eigen values and vectors which are useful in understanding core subjects like data mining, signals and systems etc</p> |
| 12EE204CV | Principles of Electrical Engineering | <p>At the end of the course a student will be able to:</p> <p>CO1: Students understand the basic concepts of electrical parameters and responses of various electrical elements with different theorems.</p> <p>CO2: Students define various terms related to alternating circuits which are used for all household appliances and also the concept of impedance, power in ac circuits.</p> <p>CO3: In this course students learn the constructional features, principal of operation and the significance of AC and DC Machines and their characteristics</p> <p>CO4: Students can design electrical and electronics circuits and conduct experiments with electrical systems analyze and interpret data.</p> |
| 12ES201CV | Environmental Studies | <p>At the end of the course a student will be able to:</p> <p>CO1: At the end of the course students develop awareness about the hazards to environment</p> |

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| | | <p>CO2:They will develop awareness about optimum utilization of natural resources</p> <p>CO3:They will learn about GREEN TECHNOLOGIES to maintain sustainable development</p> <p>CO4:They get awareness about rules and regulations applicable for pollution control</p> |
| 12EC231CV | Electronic Devices & Circuits lab | <p>At the end of the course a student will be able to:</p> <p>CO1: The course intends to provide an overview of the principles, operation and application of the basic electronic components.</p> <p>CO2: Understand the Characteristics of the active devices.</p> <p>CO3: To understand the frequency response of different amplifiers.</p> |
| 12EC232CV | Basic Simulation lab | <p>At the end of the course a student will be able to:</p> <p>CO1. The course intends to provide an overview of signal analysis.</p> <p>CO2.This course relies on elementary treatment and qualitative analysis of Fourier Transform, Laplace Transform and Z-Transforms</p> <p>CO3. To provide an overview of signal transmission through linear systems, convolution and correlation of signals and sampling.</p> <p>At the end of the course a student will be able to:</p> |
| 12EG231CV | Verbal Ability lab | <p>CO1:At the end of the course it inculcates reading habit to improve concentration skills</p> <p>CO2: It sharpens comprehension skills and enables to analyze the described situation</p> <p>CO3:Helps students develop writing skills through activities like essay writing and letter writing</p> <p>CO4: Will become proficient in grammar rules and vocabulary in English</p> |
| II B.Tech- II semester | | |
| 12EC251CV | Electronic Circuit Analysis | <p>At the end of the course a student will be able to:</p> <p>CO 1. Analysis and design of all types of electronic amplifiers and oscillators.</p> <p>CO 2. Introducing the concept of the feedback in amplifiers.</p> <p>CO 3. Verifying measured amplifier response through computer simulation and Lab experiment</p> |

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| 12EC252CV | Pulse & Digital Circuits | <p>At the end of the course a student will be able to:</p> <p>CO 1.Design of linear and non linear wave shaping circuits for various input signals.</p> <p>CO 2. Design and analyze different multi vibrators and time base generators.</p> <p>CO 3. Understand the principles of synchronization and frequency division in systems operating at different frequencies.</p> <p>CO 4. Apply the concepts of pulse and digital circuits to build real time applications.</p> |
| 12EC253CV | Logic & Switching Theory | <p>At the end of the course a student will be able to:</p> <p>CO1: Knowing the basic differences between analog and digital systems</p> <p>CO2:Use binary numbers and codes</p> <p>CO3:Describe the operation of logic gates</p> <p>CO4:Applying Boolean algebra on K-map</p> <p>CO5: Design a combinational and sequential logic circuits to simplify function</p> |
| 12EC255CV | Control Systems | <p>At the end of the course a student will be able to:</p> <p>CO 1. Understand stability concept and time domain analysis using time and frequency response.</p> <p>CO 2. Modeling and analysis of simple physical system are investigated.</p> <p>CO 3. To study controller units, their type analysis and tuning.</p> <p>CO 4. Design Lead-Lag compensators based on frequency data for an open-loop linear system.</p> |
| 12EC254CV | EM Theory & Transmission lines | <p>At the end of the course a student will be able to:</p> <p>CO 1. Understand the basic concept of vector analysis.</p> <p>CO 2. Analysis of electrostatic field due to different forms of electric charges and Studying of moving charges, conductor, semiconductor and dielectric.</p> <p>CO 3. Analysis of magneto static field due to different forms of current element</p> <p>CO4. To apply wave theory to uniform plane waves in different media.</p> <p>CO5. To analyze its performance when incident on a boundary between two mediums.</p> <p>CO 6. To analyze radio wave propagation channels in medium, high and very high frequencies.</p> |

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| 12EC281CV | Electronic Circuits Analysis lab | <p>At the end of the course a student will be able to:</p> <p>CO1. Understand the operating principles of major electronic devices, circuit models and connection to the physical operation of the devices.</p> <p>CO2. Able to apply this knowledge to the analysis and design of basic circuits.</p> <p>CO3. An ability to design and conduct experiments, as well as to organize, analyzes, and interprets data.</p> <p>CO4. An ability to identify, formulates, and solves hardware engineering problems.</p> |
| 12EC282CV | Pulse & Digital Circuits lab | <p>At the end of the course a student will be able to:</p> <p>CO1. An ability to design and conduct experiments, on RC circuits</p> <p>CO2. An ability to design and conduct experiments, on clipping circuits & clamping circuits.</p> <p>CO3. An ability to design and verify the truth tables of different logic gates</p> <p>CO4. An ability to design a Transistor switch.</p> |
| 12EE283CV | Electrical Engineering lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Students practically understand the basic concepts of electrical parameters and responses of various electrical elements with different theorems.</p> <p>CO2: Students design the different alternating circuits which are used for all household appliances and also know the concept of impedance, power in ac circuits.</p> <p>CO3: They learn & design the principal of operation and the significance of AC and DC Machines and their characteristics.</p> <p>CO4: Students can design electrical and electronics circuits and conduct experiments with electrical systems analyze and interpret data.</p> |
| 12EG281CV | Reasoning & Logic lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Students are honed to identify and rationalize the relationship between words</p> <p>CO2: Students are introduced to concepts of statement, argument, assumption and courses of action which enables them to use logic to match these aspects.</p> <p>CO3: Students are taught coding and decoding. It enables them to link words with the codes logically and arrive at correct meanings</p> |

| III B.Tech- I semester | | |
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| 12EC303CV | Analog Communications | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the basics Amplitude modulation, mathematical description and spectral analysis of DSB-TC, DSBSC, VSB, and QAM.</p> <p>CO2: Understanding the Angle modulation, mathematical description, spectral analysis and modulation and demodulation.</p> <p>CO3: Draw on their knowledge on sampling theorem and its practical aspects, time division multiplexing, pulse modulation and demodulation.</p> <p>CO 4: Understand the concept of Analog Pulse Modulation PAM, PWM, and PPM.</p> <p>CO5: Understand the basics of ?Baseband Digital Modulation: Pulse Coding Modulation (PCM), DPCM and Delta Modulation (DM). Prediction.</p> |
| 12EC304CV | IC Applications | <p>At the end of the course a student will be able to:</p> <p>CO1: Describe the IC fabrication technologies, specifications and its uses.</p> <p>CO2: Analyze the operational amplifiers, timers and their applications in electrical and electronics circuits.</p> <p>CO3: Analyze different conversion techniques (DC and DAC). CO4: Acquire the knowledge on Digital IC families, its specifications and applications.</p> <p>CO5: Distinguish linear and digital ICs for different application areas.</p> |
| 12EC305CV | Computer Organization & Architecture | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the basic components of a computer, including CPU, memories, and input /output, and their organization.</p> <p>CO2: Understand register transfer language (RTL) and its relation to microprogramming with an introduction to CISC.</p> <p>CO3: Describe the concept behind hardwired control (RISC) and to capture the concept of pipelining in these architectures.</p> <p>CO4: Describe the cost performance tradeoff in designing memory hierarchy and instruction sets.</p> <p>CO5: Follow the trends in computer design and appreciate the design philosophy behind.</p> |

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| 12EC302CV | Antennas & Wave Propagation | <p>At the end of the course a student will be able to:</p> <p>CO1: Specify the parameters of an antenna for FM Radio/ Mobile phone/ DTH TV/ WLAN.</p> <p>CO2: Design a wire antenna with desired radiation pattern and polarization.</p> <p>CO3: Design a feed antenna and parabolic antenna for satellite communication system.</p> <p>CO4: Specify the maximum usable frequency, skip distance for propagation via the Ionosphere.</p> |
| 12MG301CV | Managerial Economics & Financial Analysis | <p>At the end of the course a student will be able to:</p> <p>CO1:At the end of the course the students would be able to think like professional economists and understand economic issues concerning business</p> <p>CO2:Would be able to solve business problems with the help of quantitative analysis</p> <p>CO3:Gain knowledge of terms like demand analysis and forecasting, production& cost, market structures and pricing decisions</p> <p>CO4: Would gain knowledge of financial accounting and analysis</p> |
| 12EC331CV | Analog Communications lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Should be able to explain modulation and demodulation technique techniques in various communications</p> <p>CO2: Should be able to understand the operations of different types of detectors.</p> <p>CO3: Should be able to analyze the signal transmission and receiving fundamental concepts.</p> <p>CO4: Should be able to describe the operation of Multiplexing techniques.</p> |
| 12EC332CV | IC Applications lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Describe the IC fabrication technologies, specifications and its uses.</p> <p>CO2: Analyze the operational amplifiers, timers and their applications in electrical and electronics circuits.</p> <p>CO3: Analyze different conversion techniques (DC and DAC)</p> <p>CO4: Acquire the knowledge on Digital IC families, its specifications and applications.</p> <p>CO5: Distinguish linear and digital ICs for different application areas.</p> |

| III B.Tech- II semester | | |
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| 12EC351CV | Electronic Measurements & Instrumentation | <p>At the end of the course a student will be able to:</p> <p>CO1: Understanding the basic measurement techniques such as accuracy, precision, standards.</p> <p>CO2: Analyze the performance characteristics of each instrument.</p> <p>CO3: To study the operation and construction of analog, electronic and digital multi-meters</p> <p>CO4: Understand about different transducer and working principle.</p> |
| 12EC352CV | Digital Communications | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the theoretical aspects of digital communication system, useful for today's multidisciplinary applications.</p> <p>CO2: Learn the elements of digital communications systems, fundamental concepts of sampling theorem, quantization and coding.</p> <p>CO3: Understand the different types of digital pulse and band pass modulation techniques.</p> <p>CO4: Able to calculate probability of error for method filter Receiver and various digital modulation techniques to analyze the performance of DCS in the presence of noise.</p> <p>CO5: Able to do the source coding problems and understand the compact description of sources.</p> |
| 12CS35BCV | Operating Systems | <p>At the end of the course a student will be able to:</p> <p>CO1: Master functions, structures and history of operating systems</p> <p>CO2: Master understanding of design issues associated with operating systems</p> <p>CO3: Master various process management concepts including scheduling, synchronization, deadlocks.</p> <p>CO4: Master concepts of memory management including virtual memory performance of DCS in the presence of noise.</p> <p>CO5: Master issues related to file system interface and implementation, disk management.</p> <p>CO6: Be familiar with various types of operating systems including</p> |

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| 12EC353CV | Microprocessors & Microcontrollers | At the end of the course a student will be able to: CO1: Study and understand internal structure and external connection of microprocessor. CO2: Write Assembly level language programs for any application using MASM Software. CO3: Understand the architectural difference between the Processor and Controllers. CO4: Describe the instruction set and Addressing modes difference between 8086 and 8051. CO5: Understand the advanced features of AVR microcontrollers compared with 8051. |
| 12EC354CV | Digital Signal Processing | At the end of the course a student will be able to: CO1: Understand concepts ADC and DAC techniques and their circuit implementation CO2: Understand DFT, DCT and FFT algorithms CO3: Design procedures of digital filters and Realization topologies CO4: Design of FIR and IIR filters CO5: MATLAB usage in designing digital filters |
| 12CS359CV | Computer Networks (Elective) | At the end of the course a student will be able to: CO1: Understand the Layered Architecture of Computer Networks. CO2: Analyze the operation of the main components of computer networks. CO3: Learn various network protocols and algorithms. CO4: Acquire the required skill to design simple computer CO5: Get familiar with security risks threatening computer networks. |
| 12EC381CV | Microprocessors & Microcontrollers lab | At the end of the course a student will be able to: CO1. Execution of different programs for 8086 in Assembly Level Language using MASM Assembler. CO2. Interfacing various I/O Devices like stepper motor, key board, ADC AND DAC TO 8086. CO3. Execution of different programs in 8051. etc they will learn assembly language program. |
| 12EC382CV | Digital Signal | At the end of the course a student will be able to: CO1: quickly choose and design digital filters |

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| | | <p>CO2: Estimate power spectral densities using a variety of techniques</p> <p>CO3: Perform the deconvolution of two signals</p> <p>CO4: Construct a simple digital communication system</p> |
| 12EG381CV | Advanced English Communication & soft skills lab | <p>At the end of the course a student will be able to:</p> <p>CO1: students evolve as effective communicators and emerge as good decision makers and managers.</p> <p>CO2: Student develops holistic soft skills and develops right critical and analytical skills.</p> <p>CO3: Students are enabled to present their skills confidently and face interviews to capture the right job.</p> <p>CO4: Students are trained to develop leadership qualities and team building skills and organize the ideas and information relevantly and coherently</p> |
| 12MT381CV | Quantitative ability lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Like Data Interpretation this course helps the students to take the competitive examinations better equipped</p> <p>CO2: This would help the students to master different quantitative methods</p> |
| IV B.Tech- I semester | | |
| 12EC402CV | Microwave Engineering | <p>At the end of the course a student will be able to:</p> <p>CO1: Acquire the knowledge of designing waveguide transmission systems: rectangular and Circular.</p> <p>CO2: Gain the knowledge of using Smith chart to determine impedance and reflection coefficient.</p> <p>CO3: Describe the using of Scattering Matrices to analyze microwave devices.</p> <p>CO4: Acquire the knowledge of designing micro strip antennas.</p> |
| 12EC406CV | Digital Image Processing | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand how images are formed, sampled, quantized and represented digitally.</p> <p>CO2: Understand the image edge detection, image restoration, image segmentation, and image enhancements.</p> |

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| | | <p>CO3: Understand transform-domain representation of images (Fourier, DCT, Haar, WHT)</p> <p>CO4: Understand the principles of image compression using wavelet transforms.</p> |
| 12EC401CV | VLSI Design | <p>At the end of the course a student will be able to:</p> <p>CO1: Design of Digital VLSI Circuits, stick diagram of circuits.</p> <p>CO2: Understand the design Rules of VLSI circuits.</p> <p>CO3: Understand and simulate speed and power Considerations, Floor Planning and Layout techniques</p> <p>CO4: Be able to complete a significant VLSI design project having a set of objective criteria and design constraints.</p> |
| 12EC455CV | Optical Communications (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the theory of light propagation in optical fibers with different types.</p> <p>CO2: Understand the overview of opto-electronic device requirements for communication systems, including light sources, optical amplifiers and light detectors.</p> <p>CO3: Adjustment of a complete optical communication system.</p> |
| 12EC407CV | Embedded & Real Time Systems (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Provide with an enhanced base of knowledge and current and reflective practice necessary to initiate a career in embedded systems at the professional engineer level.</p> <p>CO2: Enhance specialist knowledge in the area of Embedded systems which build upon studies and the undergraduate level.</p> <p>CO3: Develop improved skills of independent learning and critical appraisal.</p> <p>CO4: Ability to progress to the next level of study as appropriate.</p> <p>CO5: Critically evaluate engineering methodologies and where appropriate propose new hypothesis.</p> |
| 12EC431CV | ECAD & VLSI lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Design Entry & simulation of Multiplexer circuit with test bench & functional verification.</p> <p>CO2: Design Entry & simulation of D flip-flop circuit with test bench & functional verification.</p> |

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| | | <p>CO3: Synthesis, P&R and Post P&R simulation for Full adder, Concepts of FPGA floor plan, critical path, design gate count, I/O configuration and pin assignments.</p> <p>CO4: Generation of configuration/fuse files for 4:1 multiplexer & D flip-flop & implementation of the hardware using FPGA.</p> <p>CO5: Design a schematic and simple layout for CMOS Inverter, parasitic extract.</p> |
| 12EC432CV | Microwave & Optical Communications lab | <p>At the end of the course a student will be able to:</p> <p>CO1: Gain knowledge and understanding of microwave analysis methods.</p> <p>CO2: Be able to apply analysis methods to determine circuit properties of passive/active microwave devices.</p> <p>CO3: Know how to model and determine the performance characteristics of a microwave circuit or system using computer aided design methods.</p> <p>CO4: Have knowledge of basic communication link design; signal power budget, noise evaluation and link carrier to noise ratio.</p> <p>CO5: Have knowledge of the transmission and waveguide structures and design it for practical applications.</p> |
| 12EC433CV | Industry Oriented Mini project | <p>At the end of the course a student will be able to:</p> <p>CO1: Gain knowledge about the different research areas in the field of Electronics & Communications.</p> <p>CO2: Be able to apply the theoretical concepts to design real time applications.</p> <p>CO3: Know the problems faced by the industry in designing new technologies.</p> |
| IV B.Tech- II semester | | |
| 12EC403CV | Cellular & Mobile Communications (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the fundamentals of mobile and cellular communications.</p> <p>CO2: Understand the system design, cell capacity and blocking probability</p> <p>CO3: Understand Multiple Access Techniques- channel coding in mobile communication Frequency Reuse - cell cluster concept.</p> <p>At the end of the course a student will be able to:</p> |

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| 12EC452CV | Radar Systems | <p>CO1. Understand the basic principles of how a RADAR system works.</p> <p>CO2. Identify the various RADAR systems in existence, specify their applications and limitations and explain the principles of how they work.</p> <p>CO3. Describe the most commonly used techniques in processing RADAR signals.</p> |
| 12EC454CV | Digital design through Verilog (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Define and describe digital design flows for system design recognizes the tradeoffs involved in different approaches.</p> <p>CO2: Describe, design, simulate and synthesize computer hardware using verilog HDL.</p> <p>CO3: Know the fundamentals of verilog, with particular emphasis on synthesize constructs.</p> <p>CO4: Develop digital systems in a hierarchical and module nature to aid testing, debugging and hardware reuse.</p> <p>CO5: Design combinational, sequential logic and complex state machines (present in all practical computers).</p> |
| 12EC458CV | Wireless Communication Networks (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand the Theory and systems of wireless communication systems.</p> <p>CO2: Understand the WLAN concept and theory.</p> <p>CO3: Understand the Multiple access techniques</p> |
| 12EC451CV | Satellite communication (Elective) | <p>At the end of the course a student will be able to:</p> <p>CO1: Understand an overall view on the different aspects concerning the satellite on a communication system.</p> <p>CO2: Understand the different types of satellite orbits.</p> <p>CO3: Understand the different types of satellite communication system</p> |
| 12EC481CV | Seminar | <p>At the end of the course a student will be able to:</p> <p>CO1: Distinguish the multiple senses of a subjects (literal and beyond the literal).</p> <p>CO2: Identify and understand assumptions, theses, and arguments that exist in the work of authors.</p> |

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| | | <p>CO3: Evaluate and synthesize evidence in order to draw conclusions consistent with the subject. Seek and identify confirming and opposing evidence relevant to original and existing theses.</p> <p>CO4. Ask meaningful questions and originate plausible theses.</p> |
| 12EC483CV | Comprehensive Viva | <p>At the end of the course a student will be able to:</p> <p>CO1: Face any type of interviews, viva-voce, and aptitude tests.</p> <p>CO2: Perform well in competitive exams and group discussions.</p> <p>CO3: Apply knowledge in building their career in particular fields.</p> <p>CO4: Enhance their communication skills and interactivity.</p> |

LABORATORY DETAILS



VLSI CENTER OF EXCELLENCE

The pride and honour of ECE Department, this lab is just set to raise the eminence and elegance of the VLSI Design equipped with the modern EDA softwares like Cadence Tools Suite; Xilinx ISE 12.4 and other tools. This lab brings glory to the entire institute.

EMBEDDED SYSTEMS LAB

Embedded Systems Lab provides students with hands-on experience with building, programming, testing and Debugging processors, micro controller and FPGA-based systems. It is an interdisciplinary facility with collaborative projects.



ELECTRONIC DEVICES AND CIRCUITS LABORATORY & INTEGRATED CIRCUIT LABORATORY



Semiconductors, Transistors, Circuits, Gates, Flipflops, Counters etc., are the domain of electronic devices and circuits lab.

In IC Lab OP-Amp 741 and 555 Timer rules. Student learn how linear circuits perform various operations and get acquainted with with filter design.



BASIC SIMULATION LABORATORY & DIGITAL SIGNAL PROCESSING LABORATORY



The Pride and honour of ECE Department, this lab is just set to rise the eminence and elegance of the Matlab.

The existing concepts of Digital Signal Processing and filter design are learnt and assimilated by the students in this lab.



ANALOG COMMUNICATION LABORATORY & DIGITAL COMMUNICATION LABORATORY

Analog modulation techniques (Amplitude modulation, DSB-SC, SSB, Frequency modulation, FDM) are analyzed through trainer kit and also with matlab.

Digital modulation techniques (PCM, PWM, PAM, Delta modulation, TDM) are analyzed through trainer kit.



PULSE & DIGITAL CIRCUIT LABORATORY & ELECTRONIC CIRCUIT ANALYSIS LABORATORY

Clippers & Clampers Transistor as switch and Multivibrators (Astable, Monostable, Bistable) are the domain of PDC Lab.

Amplifiers, Oscillators, Power Amplifiers, are designed through bread board and multisim software.



MICROPROCESSORS & MICRO-CONTROLLERS LABORATORY & MICROWAVE LABORATORY



MP & MC Lab provides students with hands-on experience with building, programming, testing and debugging processor, micro-controller using MASM and keil software.

Microwave wizard makes students acquainted with interesting world of Microwave communications etc.,



DEPARTMENT LIBRARY



The Department Library has 438 volumes, 346 titles, reports of main projects and mini projects of B.Tech & M.Tech.

The library is open during working hours for the faculty.



PLACEMENTS

The College has a Centre for Student Services and Placement, which gives personal and career counseling to the students. The idea is to enable students to effectively cope with life at College as well as in their career. One of the major objectives of the centre is to help students in obtaining internships and placements in reputed companies across various industrial sectors. Assistance is also provided to students in procuring higher education opportunities. The College offers special coaching for GATE, TOEFL, and GRE to its students. They are also encouraged to present technical papers at seminars in other colleges with a view to improving their research and presentation skills. Also, during the last few years, several personality development programs have been conducted by experts from industry.

CVR'ites managed to grab the highest number of recruitments among similar aged institutions. The students of the college garnered the highest number of placements in any off campus pool drives held during the last 4 years

YEAR 2013-14 , ECE Placement Details

| S.No. | CompanyName | Count |
|-------|------------------|-----------|
| 1 | Deloitte | 2 |
| 2 | TCS | 9 |
| 3 | Virtusa | 13 |
| 4 | Capgemini | 2 |
| 5 | ADP | 2 |
| 6 | Mphasis | 5 |
| 7 | NTT Data | 5 |
| 8 | Tech Mahindra | 13 |
| 9 | HpDev | 1 |
| 10 | SAP Labs | 2 |
| 11 | GGK Technologies | 5 |
| 12 | Infosys | 7 |
| 13 | CommScope | 2 |
| 14 | HCL Comnet | 1 |
| 15 | CTS | 6 |
| 16 | PWC | 2 |
| 17 | CSC | 5 |
| 18 | Contentera | 1 |
| 19 | HCL Technologies | 1 |
| 20 | LGsoft | 1 |
| 21 | IBM | 6 |
| | Total | 91 |

YEAR 2014-15 , ECE Placement Details

| S.No. | CompanyName | Count |
|-------|------------------|------------|
| 1 | Deloitte | 1 |
| 2 | TCS | 57 |
| 3 | Capgemini | 8 |
| 4 | HSBC Dev | 1 |
| 5 | GGK Technologies | 6 |
| 6 | ADP | 2 |
| 7 | Mphasis | 7 |
| 8 | Mu-Sigma | 3 |
| 9 | BroadCom | 3 |
| 10 | Net.Orange | 3 |
| 11 | Mindtree | 2 |
| 12 | IBM Dev | 7 |
| 13 | NTT Data | 3 |
| 14 | NebuLogic | 2 |
| 15 | GlobalEdge | 4 |
| 16 | HCL | 1 |
| 17 | Cyient | 2 |
| 19 | CSC | 2 |
| 20 | Polaris | 8 |
| 21 | Amazon | 1 |
| 22 | Verizon | 2 |
| 23 | CommScope | 1 |
| | Total | 126 |

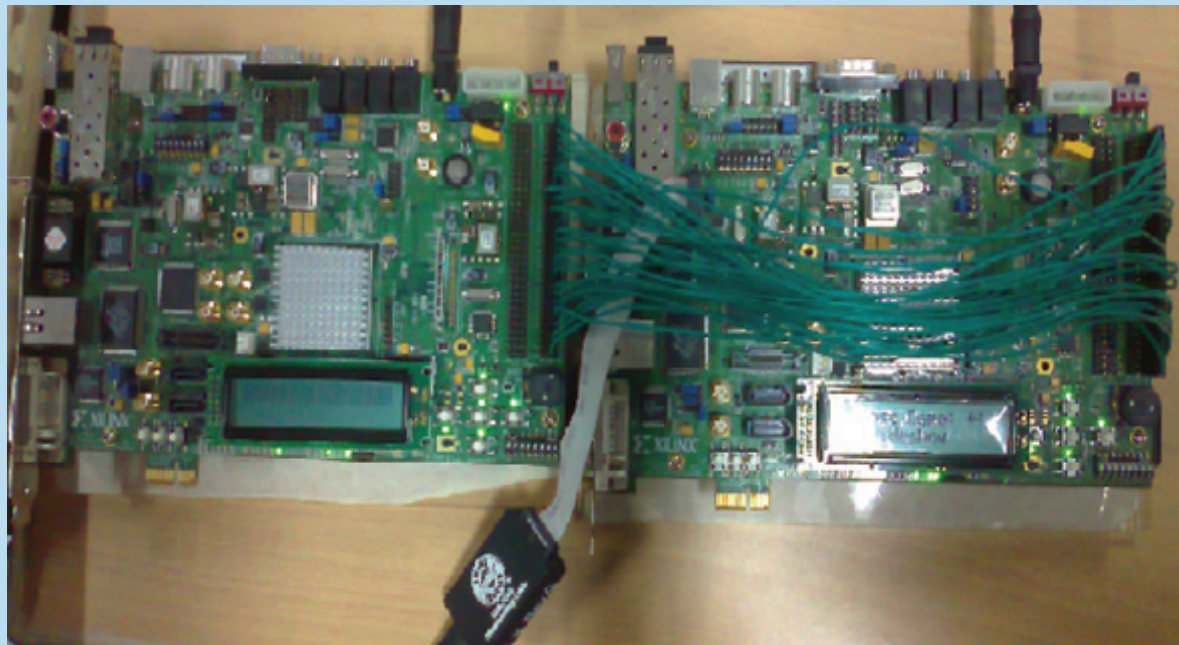
RESEARCH AND DEVELOPMENT

Patent and Research award: Dr. Esther Rani. worked on the research topic of, "Design of Modified Self-Sleep Buffer for Distributed MTCMOS Technique in Arithmetic And Fast Computations". In her work, four different methods for the design of self sleep circuit had been proposed, implemented and verified in the design of a simple General Purpose Microprocessor and Fast Fourier Transform (FFT) for the optimization of power in standby mode. Whole design has been carried out in 90-nm technology with 2GHz clock frequency using Cadence tools. This has been filed for patent and it was published in 'The Official Journal of Patent Office' on 30/05/2013 with the title, "Self Sleep Device For Low Power VLSI Applications". Dr. Esther Rani also has been awarded the "Research Award" by UGC for the period of two years from Mar' 2015-Feb' 2017 with a research grant.

Consultancy projects: This department has entered into prestigious contracts with **ECIL and DRDO** for developing high end products. DRDO, Hyderabad has sanctioned three projects worth 28 lakhs and all the three have been successfully completed

1. OFDM for DRDL

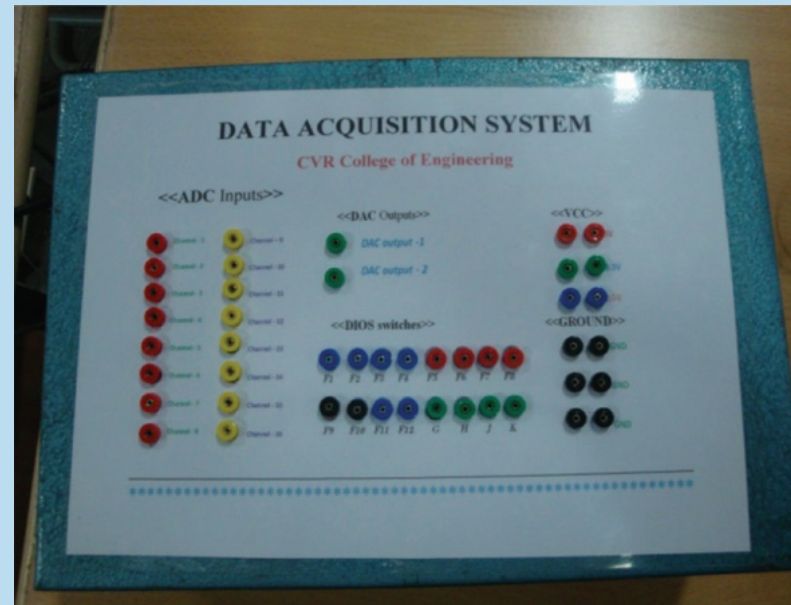
It is a new modulation technique for baseband modulation to increase the capacity of high speed radio channels. It was implemented on FPGA by using the state of the art tools and delivered to DRDL which they used with proper engineering works for radio communication between missile and control center. Value of the order Rs. 9, 00,000/-.



The OFDM hardware configuration using FPGA

1.Data Acquisition Hardware for DRDL

This is a system for connecting various types of analog and digital inputs through a universal interface to connect to the processing unit for data logging and the limit checks. It was delivered to DRDL and implemented on FPGA for integration for their flight trials feedback. Value of the order was Rs. 9, 00,000/-.



The final DAS product deliverable at DRDL

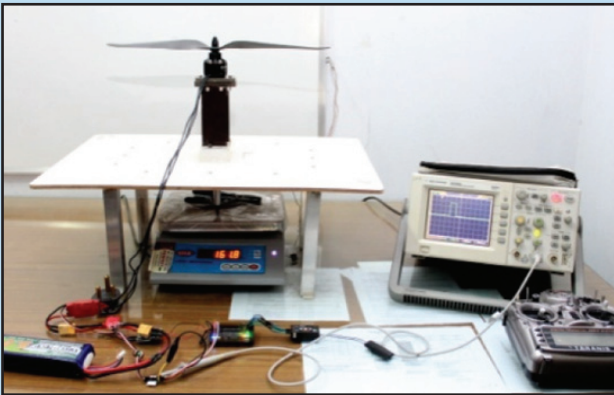
1.Data Acquisition Engine

This is a software running on CPU implemented on FPGA with universal interface as described in item 2 above for storing of data and display. This system was delivered to DRDL. Value of the order was Rs. 9,00,000/-.

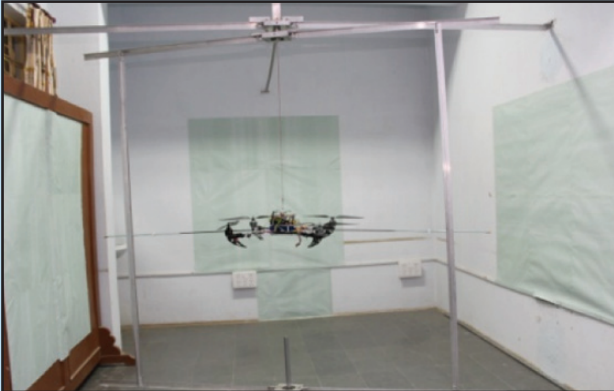
Development of Robust and Low Cost Unmanned Aerial Vehicles [U A Vs]for Surveillance & Commercial Applications

R &D work

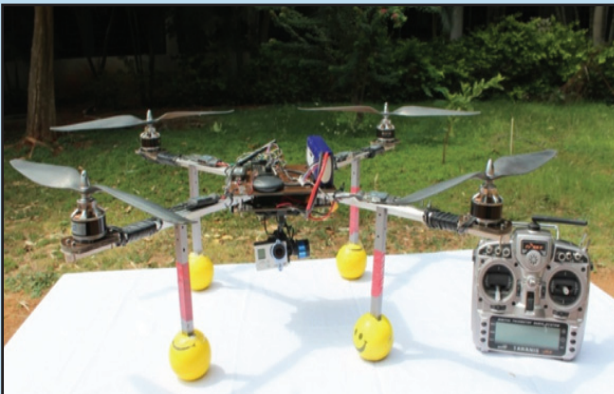
The project is funded by the college management. The college management has already funded Rs 6.5 lakhs towards this project. The above area was chosen for R & D work because, in due course, the work becomes an inter- disciplinary subject and can draw both faculty and students of different departments. Presently, the faculty of ECE department has initiated this program involving seven M.Tech.(ES) students , naming it as " UAV PROJECT".



1. A Sensitive Thrust Measuring Instrument has been developed to measure the thrust produced by the Motors used in UAVs. It plays a key role in the design and fabrication of UAVs. We used this instrument to develop UAVs for Agricultural Applications mentioned above.



1. A UAV Test Jig (first stage) has been designed and developed to minimize the imbalances in UAVs. UAV Test Jig is used to fine tune UAVs to fix its performance.



1. Aerial survey of Agricultural land

Conducting Aerial Survey plays a significant role in Agriculture. With a GoPro camera fitted on UAV, our UAV team developed an application to conduct Aerial Survey of agricultural land.

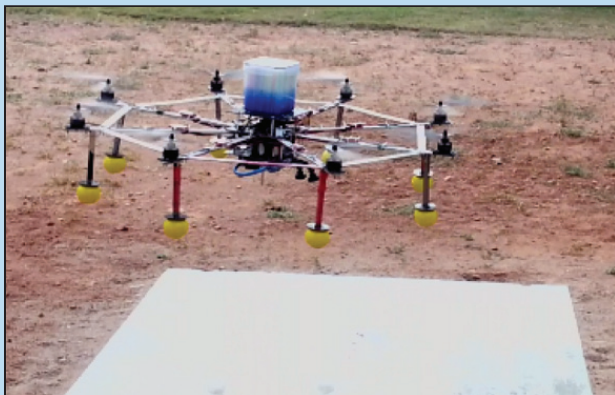
This idea is useful - by taking videos of the land periodically- comparing and with previous records. By this, we can extract valuable information like, distribution of water to the plants in the agricultural field, pest infected zones in the land, crop yield. This is the cheapest method to conduct aerial survey of lands.



2. Animal and Bird menace

Animal and Bird menace is a common problem to farmers. While animals like wild pigs spoil the crops, birds eat away most of the produce (grains, sunflower seeds etc.).

This menace can be minimized by scaring them with huge sounds and/or by shining intense light into their eyes. UAV Team developed a solution to this problem by mounting Air Horn and Powerful Light Source on the UAV and making it hover in the sky randomly in the farmer's land, to scare away birds and animals.



3. Building High Payload UAVS (Application : Spraying pesticides from UAVs)

Designing a UAV to Spray pesticides in the agricultural requires addressing a number of design metrics like payload Vs. the power source, capacity of the pesticide tank, time of flight per one time charge of batteries etc. Presently, we could carry a payload of nearly one Gallon of pesticide on UAV and spray

SDR (Software Defined Radio): The lab has universal software radio peripherals (USRPs), each of which interfaces with a desktop computer via USB interface. Each radio has the capability to communicate in various frequency bands ranging from hundreds of megahertz to few giga Hertz.

Consultancy Projects

1. Multi-Channel Analyzer

ECIL has contacted CVR college of Engineering for developing the Multi-Channel Analyzer (MCA). This is an R&D project of ECIL. MCAs are used in nuclear instruments for different applications like Isotope Identification, Alpha/Gamma spectroscopy, Liquid scintillators, etc., which demand wide resolution. Basically the analog inputs. Types of radiation detection are processed and then digitized by an ADC. The digital value of various channels are plotted on a histogram of the nuclear of counts various pulse height, i.e., pulse height spectrum. The range of pulse heights will be analyzed by the MCA for various types of detection. An FPGA having micro controller & DSP is used for peak detection, counting and histogram calculation. martFusion2 FPGA SoC consisting of flashbased FPGA fabric 166MHz ARM Cortex-M3 processor and communications interfaces on a single chip. It consists of the following modules.

- * Signal Conditioning Module
- * ADC
- * LCD Interface/Driver
- * Keyboard Interface
- * JTAG
- * TFT Module
- * Digital Output/Inputs

2. Digital Controller for Variable Speed drive

The college is actively interacted with ECIL for the development of "Digital Controller for Variable Speed drive" for the applications of supplying coolant for Nuclear Reactors. The technicalities of the design and fabrication of HMI software and hardware is under development. HMI is practically an industrial PC with CPU integrated behind the monitor. It is mounted on the cabinet door of the Unit. HMI software is to be developed in visual basic or visual C. Screens consist of mimic diagrams, block diagrams, soft switches for ON, OFF, RESET operations etc., motor parameter list, energy consumption, control parameters like kp, ki, annunciator windows etc. HMI communicates with controller board, IO board on RS485 with MODBUS protocol and with control room by Ethernet.

3. Intelligent Eye for the Blind and Visually impaired with a hearing aid

The objective of this work is to help blind persons and the visually impaired, to read text label on product packages, bus routes, medicine bottles and handouts. For this purpose image to text conversion can be performed using image processing algorithms and several techniques to recognise character and conversion of this character to text and then to speech is required. The text regions must be localized automatically from which the character recognition must be done and then the text extraction. Each letter must be recognized by learning method. The extracted text then be converted into speech by using Speech Application Programming Interface(SAPI).

This Project has been applied to NASSCOM Social Innovation Forum and cleared two levels.

4. Intrusion Detection System

A very powerful processor with high capacity GPU processing images for object detection and localization for perimeter protection of vital installations. This system has been demonstrated to ECIL and we are awaiting a commercial order from ECIL for this.

5. Target Tracking by Thermal Imaging

A system has been developed for proof of concept for tracking of target by a missile for which a demonstration was given recently to BDL with thermal imaging. We are discussing with BDL about the scope of the work.

6. IT in Agriculture

A system has been designed for studying health and need for input for plants in agricultural cultivation by multispectral analysis of the airborne images. Discussions are in progress with ECIL for marketing the product through agricultural universities.

PROFESSIONAL ACTIVITIES

- 1) **IETE** : The Institution of Electronics and Telecommunication Engineers
The IETE Students' Forum of CVRCE was formed in the year 2011.



Student members of IETE Tech Fest -2015



Industrial Visit by ECE Students to RTTC BSNL, Gachibowli,
14th & 15th November 2015



Students briefing their project to the principal,
HOD & Professors at Project Expo - IETE Tech Fest,
9th Jan 2015



Enlightened talk by HOD in IETE Tech Fest,
9th Jan 2015

2) **Technolites** : Technolites the student association was formed on 25th August 2015



Enlightened talk by Mr. P Sudhakara Rao, GM NWP CM, BSNL, AP &Telangana on "Evolution and Future of Mobile Communications in India



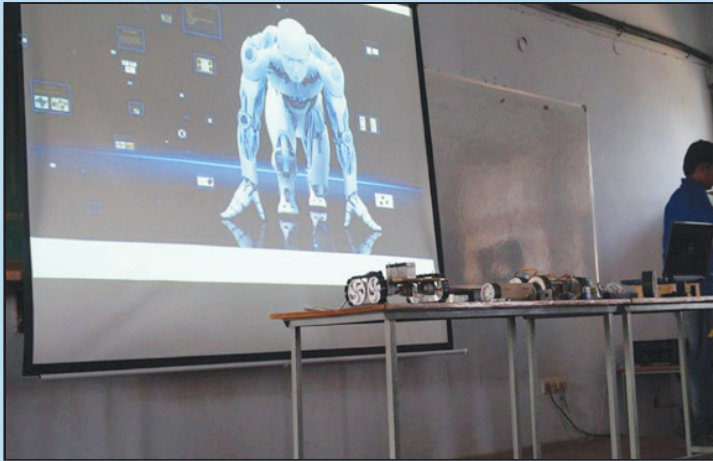
Enlightened talk by Smt. GeetaVaradan, fellow of IETE and Director of the Advanced Data Processing Research Institute of the Indian Space Research Organization (ISRO)



Chairman Dr. Cherabuddi V. Raghava felicitating Smt. Geeta Varadan, fellow of IETE and Director of the Advanced Data Processing Research Institute of the Indian Space Research Organization (ISRO)



Dr. Nayanathara K Sattiraju delivering lecture to the participants on Electromagnetics and Transmission lines (EMTL) in the workshop



Workshop on Robotics



Technolites Team



Participants of EMTL workshop



Photo Gallery in IMPETUS 2K15

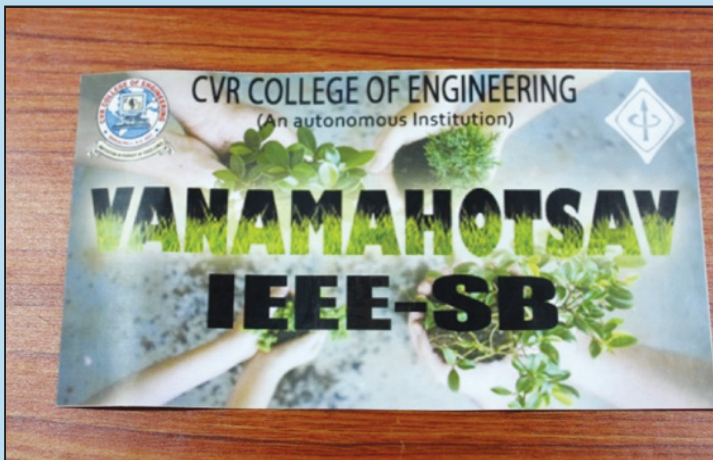


Workshop on Micro Controllers



Prize Distribution in IMPETUS 2K15

3) IEEE Student Branch:



Vanamahotsav on 10 July 2015



Planting Trees by the Director of CVREC



Students Participated in IEEE ZONAL CONGRESS MEETING



ENGINEER'S DAY at CVR on 15th September 2015



Women's Celebration with chief Guest Ms. Vinita Surana, Director of Surana Companies 8th March 2015



Speech by Mrs. Sujana Cherabuddi on women's day, 8th March 2015