# S.S.B.N. DEGREE COLLEGE

**(AUTONOMOUS)**

**ANANTAPURAMU – 515 001**

# DEPARTMENT OF ELECTRONICS

# DEPARTMENTAL PROFILE

# SRI SAIBABA NATIONAL DEGREE COLLEGE::ANANTAPUR
# (Autonomous)
# Department of Electronics

## Prologue:

The Anantapur District National Education Trust (ADNE), Anantapur, is a voluntary body consisting of elite of the town and has in its fold Viz., lawyers, doctors, engineers, professors with a sacred task of service to society. The foremost aim of this Trust is to make education available to evry needy in the district in general and suburbs in particular. The august motto has been well served by all successive managements for the past four decades. The Degree College was established in October, 1981 as per the G.O. Ms. No.1016, dated 7-9-1981. An institution which started as an elementary school in the early forties has now risen to the gigantic structure of a full-grown Degree & Post Graduate college imparting instruction in Humanities, Commerce and Sciences.Thanks to the relentless efforts of all members of the trust, who have thrown themselves heart and soul to make the institution what it is today. This Degree college was inaugurated by the Honourable Minister for education, Government of A.P., Sri Bhavanam Venkatrami Reddy on 14-12-1981. This institution was given permanent affliation on 20-05-1987 by Sri Venkateswara University, Tirupati and later on affliated to Sri Krishna Devaraya University, Anantapur, from the academic year, 1987-1988. The courses offered in this institution have been approved by S.K. University, Anantapur, and recognised by the Department of Higher Education, Govt. of A.P., Hyderabad.

**SSBN** College is not mere an educational institution but it is a commitment towards building a new generation of smart and capable individuals-the custodians of future.

Known as lead college in this region, SSBN College has wide reputation for its quality of learning and holistic approach towards grooming the students. Not limiting to the class room teaching, education here spans beyond

curriculum and text books aimed at developing character and thus moulding the overall personality of each individual student.

We help the student in assimilating the true meaning of education in the real sense enabling them to carve a niche for themselves in the society. Our approach not only makes them succeed in the competitive scenario But teaches them the right attitude towards life so that they can become good citizens of the country.

The college can boast of its infrastructure that has been designed with special concern towards the all-round development of the young minds that use them.

This college has state of art laboratories in all disciplines. The labs are regularly upgraded with the latest equipment taking in to consideration the latest subjects and techniques that are designed not only to cater to the needs of the university curriculum but also to organize short term projects.

# PROFILE OF THE DEPARTMENT OF ELECTRONICS

The electronic science is the science of future. A course combining together the hardware &software aspects of the electronic devices with a special emphasis on microprocessors & microcontrollers is supposed to be one of the best alternative for those who opt conventional courses in place of Engineering education.


The Department of Electronics has a humble beginning with **U.G. course (M.P.E.)** in the year 1995 with an intake of 30 students (Proc. RC No.104/APSCHE/95). Later the AP state council of higher education sanctioned another course in **Electronics with Mathematics and Computer Science combinations (M.E.Cs)** in the year 2003 (Proc. No.11/SKU/APSCHE/UG/SECY/2003). The Department has flourished slowly & steadily and could become a **Post-graduate Department in the year 2002** (Proc. RC No./APSCHE/PG/133/SECY/2002. **Due to the cancellation of reimbursement by the AP Govt. to the Aided and Private colleges, admissions are not upto the mark. So, the PG course is winded up from the academic year 2020-21.**

This Department of Electronics is now a well established department with modern equipment and furniture suitable for Post graduate studies. It has state of art laboratories for both U.G & P.G courses. The labs are provided with latest equipment keeping in view the needs of the students. The Department has acquired all the necessary equipment Viz., Microprocessors, Microcontrollers, Digital Signal Processors, VLSI Trainers and Embedded Trainers. Recently it has procured Atmel microcontroller based embedded trainer.

The students are also encouraged and guided in taking up projects in various fields of Electronics. The staff is also involved in developing new experiments and some of them are being published.

## Teaching and Non-Teaching Staff of the Department :

**Teaching :**

1. Dr.C.Saritha M.Sc., M.Phil., Ph.D
   Head, Dept. of Electronics
2. Dr. V. Sukanya M.Sc., M.Phil., Ph.D
3. Mr. V.K. Sreedhar M.Sc
4. Mr. G. Bhargava M.Sc

**Non-Teaching :**

1. K. Rajendra Prasad

## Profiles of the Faculty :

### BIO-DATA

**Name** : **Dr. C. SARITHA**

**Designation** : **Lecturer in Electronics**

**College** : S.S.B.N. Degree College (Autonomous), Anantapur

**Qualifications** : M.Sc., M.Phil., Ph.D.,

**Date of Birth** : 05-06-1981

**Academic Record** :

| Course | Year | % of Marks | Class/Grade | University/Board |
|---|---|---|---|---|
| **Ph.D.,** | 2011 | --- | First | S.K.University ANANTAPUR |
| **M. Phil.,** | 2008 | 72 | First | S.K.University ANANTAPUR |
| **M.Sc.** | 2005 | 77.0 | Distinction | S.K.University ANANTAPUR |
| **B.Sc.,** | 2003 | 74.8 | First | S.K.University. ANANTAPUR |
| **D.E.C.E.** | 1999 | 68.8 | First | Govt. Polytechnic ANANTAPUR |
| **P.G.D.C.A** | 2002 | 83.2 | First | TICT Computers ANANTAPUR |

**Date of Appointment & Cadre** : 16-07-2005
Head, Dept. of Electronics

**Publications** : 10

1. Realization of Counters using 8086 Microprocessor-J.LAB EXPERIMENTS, Vol-5, 2005.
2. Design of a Decimal Counter –J.LAB EXPERIMENTS, Vol-6, 2006.
3. Simple Embedded System Design using ARM7TDMI Processor-J.LAB EXPERIMENTS, Vol-7, 2007.

4. Design of a Programmable gain amplifier ,Proc. of National Seminar on Characterization and transport properties of semiconductors, August 17th &18th, 2007, pp 87-95.
5. Design and Implementation of Flip-Flops using Field Programmable Gate Arrays, Proc. of National Seminar on Characterization and transport properties of semiconductors,Aug.17th &18th.2007, pp75-86.
6. ECG Signal analysis using wavelet Transforms, Bulg. J. Physics, Vol.35, No.1(2008) pp68-77
7. Interfacing a 12-bit ADC with the Embedded ARM processor using SPI protocol , J. Lab Experiments, Vol 8, (2008)
8. Embedded Processor based automatic temperature control of VLSI Chips J. Sensors & Transducers, Vol.100,Issue1,January,2009,pp:27-44
9. "Design and Development of ZigBee based Wireless Sensor Network for Monitoring Air Pollutants", International Journal of Scientific and Engneering Research, Vol.4, Issue 3, March 2013.
10. "Embedded based digital counters" , J. Lab Experiments, Vol 15, No-3, Sep-2015.

**Conferences/Seminars/Workshops attended:**

- Participated in the **National Seminar on VLSI Design - Trends and Tools** sponsored by the University Grants Commission ,New Delhi and Organised by the Department of Electronics, S.K. University on 19-20 March 2006 and Presented a paper "**Design of 8-Bit ALU using VERILOG**".
- Participated in the workshop on "**Real time concepts for Embedded systems**", sponsored by the University Grants Commission, New Delhi and Organized by the Department of Electronics, Sri Krishna Devaraya University, Anantapur during 16-17, March 2008.
- Organized, "**A National Workshop on Embedded Systems and applications**" in the Department of Physics & Electronics, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 4th February, 2007.

- Organized a two day "**National Symposium on Recent Trends in VLSI Design**" in the Department of Physics & Electronics, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 12th and 13th April, 2008.
- Attended " A Boot Camp on Leadership Development for women" , sponsored by the University Grants Commission, New Delhi and Organized by the Department of WEC, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 20th and 21st Feb, 2019.
- Participated in a " National Seminar on emerging Materials and Applications" , sponsored by the University Grants Commission, New Delhi and Organized by the Department of Physics and Chemistry, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 11th and 12th March, 2020.

**Any Other Information** :

- ❖ Member-Board of studies in Electronics (UG Courses), SSBN Degree College, Anantapur.
- ❖ Member in Women Empowerment Cell, SSBN Degree College, Anantapur.

# BIO-DATA

**Name** : **Dr .V. SUKANYA**

**Designation** : **Lecturer in Electronics**

**College** : S.S.B.N. Degree College (Autonomous), Anantapur

**Qualifications** : M.Sc., M.Phil., Ph.D.,

**Date of Birth** : 01-06-1983

**Academic Record** :

| Course | Year | % of Marks | Class/Grade | University/Board |
|---|---|---|---|---|
| **Ph.D.,** | 2011 | --- | --- | S.K.University ANANTAPUR |
| **M. Phil.,** | 2008 | 84 | Distinction | S.K.University ANANTAPUR |
| **M.Sc.** | 2005 | 83.2 | Distinction | S.K.University ANANTAPUR |
| **B.Sc.,** | 2003 | 83 | Distinction | S.K.University. ANANTAPUR |

**Date of Appointment & Cadre** : 1-09-2005 Lecturer in Electronics

**Publications** : 10

1. Realization of Counters using 8086 Microprocessor-J.LAB EXPERIMENTS, Vol-5, 2005.
2. Design of a Decimal Counter –J.LAB EXPERIMENTS, Vol-6, 2006.
3. Simple Embedded System Design using ARM7TDMI Processor-J.LAB EXPERIMENTS, Vol-7, 2007.
4. Design of a Programmable gain amplifier ,Proc. of National Seminar on Characterization and transport properties of semiconductors, August 17th &18th, 2007, pp 87-95.
5. Design and Implementation of Flip-Flops using Field Programmable Gate Arrays, Proc. of National Seminar on Characterization and transport properties of semiconductors,Aug.17th &18th.2007, pp75-86.
6. ECG Signal analysis using wavelet Transforms, Bulg.J. Physics, Vol.35, No.1(2008) pp68-77
7. Interfacing a 12-bit ADC with the Embedded ARM processor using SPI protocol , J. Lab Experiments, Vol 8, (2008)
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9. "Design and Development of ZigBee based Wireless Sensor Network for Monitoring Air Pollutants", International Journal of Scientific and Engneering Research, Vol.4, Issue 3, March 2013.
10. "Embedded based digital counters" , J. Lab Experiments, Vol 15, No-3, Sep-2015.

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- Participated in the workshop on "**Real time concepts for Embedded systems**", sponsored by the University Grants Commission, New Delhi and Organized by the Department of Electronics, Sri Krishna Devaraya University, Anantapur during 16-17, March 2008.
- Organized, "**A National Workshop on Embedded Systems and applications**" in the Department of Physics & Electronics, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 4th February, 2007.
- Organized a two day "**National Symposium on Recent Trends in VLSI Design**" in the Department of Physics & Electronics, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 12th and 13th April, 2008.
- Attended " A Boot Camp on Leadership Development for women" , sponsored by the University Grants Commission, New Delhi and Organized by the Department of WEC, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 20th and 21st Feb, 2019.
- Participated in a " National Seminar on emerging Materials and Applications" , sponsored by the University Grants Commission, New Delhi and Organized by the Department of Physics and Chemistry, S.S.B.N. Degree and PG college (Autonomous), Anantapur on 11th and 12th March, 2020.

**Any Other Information :**

- ❖ Member-Board of studies in Electronics (UG Courses), SSBN Degree College, Anantapur.
- ❖ Member in Women Empowerment Cell, SSBN Degree College, Anantapur.

# BIO-DATA

**Name** : **V.K.SREEDHAR**

**Designation** : **Lecturer in Electronics**

**College** : S.S.B.N. Degree College (Autonomous), Anantapur

**Qualifications** : M.Sc.,

**Date of Birth** : 01-06-1980

**Academic Record** :

| Course | Year | % of Marks | Class/Grade | University/Board |
|---|---|---|---|---|
| **M.Sc.** | 2002 | 80 | Distinction | S.K.University ANANTAPUR |
| **B.Sc.,** | 2000 | 70 | First | S.K.University. ANANTAPUR |

**Date of Appointment & Cadre** : 01-07-2019
Lecturer in Electronics

**Refresher courses/Workshops and Seminars Attended :**

| Course | Date |
|---|---|
| National symposium on "Recent Trends in VLSI Design", (12th& 13th April-2008) organized by Department of Electronics, Sri Sai Baba National College (Autonomous), Anantapur – 515 001, Andhra Pradesh, India. | 12th& 13th April-2008 |
| National Seminar on "VLSI Design-Trends and Tools" sponsored by University Grants Commission, New Delhi (March 19-20, 2006) held at | March 19-20, 2006 |

| | |
|---|---|
| Department of Electronics, Sri Krishnadevaraya University, Anantapur – 515 055, A.P, INDIA. | |
| Seminar on "Essentials of FPGA Design" sponsored by Sorokasoft(India) Private Limited,held at Mindspace, Hi-Tech City, Hyderabad, India | 2009 |
| Attended 2-day defence expo, Thiruvadendhai, Chennai | 2017 |
| Conducted tech talks on VLSI, Embedded systems at various colleges at Hyderabad | ----- |

**Any Other Information :**

- Member-Board of studies in Electronics (UG Courses), SSBN Degree College, Anantapur.

# BIO-DATA

**Name** : **G.BHARGAVA**

**Designation** : **Lecturer in Electronics**

**College** : S.S.B.N. Degree College (Autonomous), Anantapur

**Qualifications** : M.Sc., B.Ed.,

**Date of Birth** : 14-05-1990

**Academic Record** :

| Course | Year | % of Marks | Class/Grade | University/Board |
|---|---|---|---|---|
| **M.Sc.** | 2012 | 68 | First | S.V.University TIRUPATI |
| **B.Sc.,** | 2010 | 68.11 | First | S.K.University. ANANTAPUR |
| **B.Ed** | 2017 | 73 | First | S.K.University ANANTAPUR |

**Date of Appointment & Cadre** : 15-07-2019
Lecturer in Electronics

**Refresher courses/Workshops and Seminars Attended :**

| Course | Date |
|---|---|
| ❖ Participated in the **Workshop on IOT DESIGN and WEB Applications** conducted by the Department of Electronics, S.S.B.N. Degree (Autonomous) College, ANANTAPUR. | 13-12-2019 to 15-12-2019 |

**Any Other Information :**

❖ Member-Board of studies in Electronics (UG Courses), SSBN Degree College, Anantapur.

# BIO-DATA

**Name** : **K.RAJENDRA PRASAD**

**Designation** : **Lab assistant**

**College** : S.S.B.N. Degree College (Autonomous), Anantapur

**Qualification** : Intermediate

**Date of Birth** : 01-06-1985

**Academic Record** :

| Course | Year | % of Marks | Class/Grade | University/Board |
|---|---|---|---|---|
| Intermediate | 2002 | 61 | First | Bord of intermediate |

**Date of Appointment & Cadre** : 01-02-2011

Lab assistant

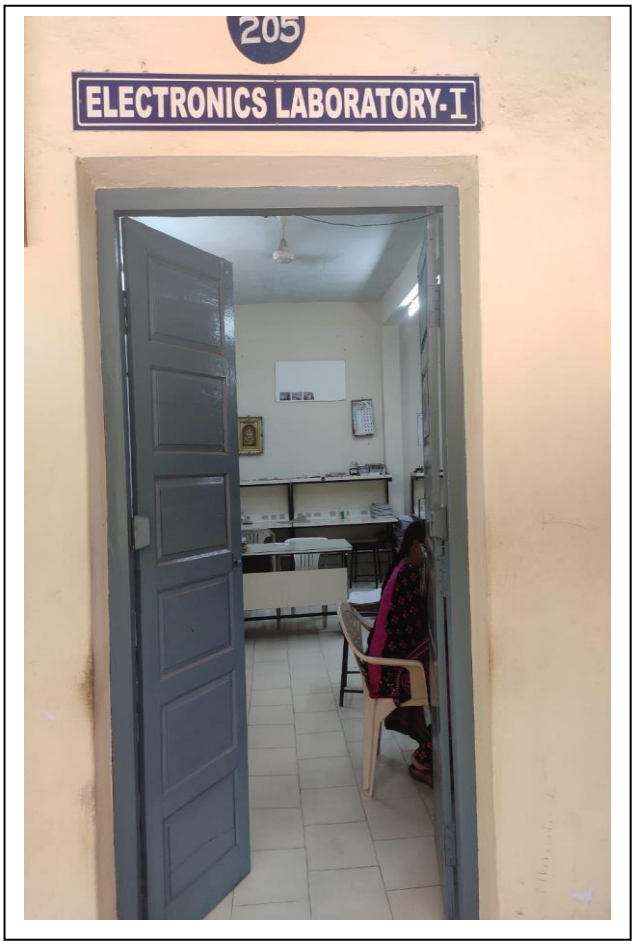
## Infrastructure Facilities :

The Department consists of five well established laboratories with advanced equipment with the following dimensions.

- **Laboratories : 5** **(Each of 30x20 Sq.Ft.)**
- **Staff Room : 1** **(20x12 Sq.Ft.)**
- **Research Centre : 1** **(25x12 Sq.Ft.)**

## LABORATORY 1 :

The following images shows the inner and outer view of lab-1. This lab is mainly used for first and second year students. This lab is equipped with **Analog devices**. In this lab maximum of 25 students can perform practicals at a time.




## EQUIPMENT AVAILABLE IN THE LABORATORY-1

| S.No. | Name of the Equipment | Quantity available | Cost in Rupees |
|---|---|---|---|
| 1 | Dual trace Oscilloscopes (CRO) 25 MHz | 4 | 17,000=00 (each) |
| 2 | Function Generators | 6 | 4000=00 (each) |
| 3 | Dual power supplies | 10 | 1,250=00 (each) |
| 4 | Regulated Power supplies | 6 | 850=00 (each) |
| 5 | Digital Multimeters | 8 | 1,850=00 (each) |
| 6 | Resistance Boxes | 15 | 700=00 (each) |
| 7 | Capacitance Boxes | 10 | 1,000=00 (each) |
| 8 | Transistorized Power Supply | 5 | 3,400=00 (each) |
| 9 | Personal Computer (Dual Core) | 1 | 25,000=00 |
| 10 | Printer | 1 | 17,000=00 |

## LABORATORY – 2:

The following images shows the inner and outer view of lab-2. This lab is mainly used for first and second year students. This lab is equipped with **Basic electronic devices**. In this lab maximum of 25 students can perform practicals at a time.


## EQUIPMENT AVAILABLE IN THE LABORATORY-2:

| S.No. | Name of the Equipment | Quantity available | Cost in Rupees |
|---|---|---|---|
| 1 | Dual trace Oscilloscopes (CRO) 25 MHz | 4 | 17,000=00 (each) |
| 2 | Function Generators | 6 | 4000=00 (each) |
| 3 | Dual power supplies | 6 | 1,250=00 (each) |
| 4 | Regulated Power supply | 8 | 850=00 (each) |
| 5 | Digital Multimeters | 6 | 1,850=00 (each) |
| 6 | Resistance Boxes | 10 | 700=00 (each) |
| 7 | Capacitance Boxes | 8 | 1,000=00 (each) |
| 8 | Desktop Computer | 1 | 30,000=00 (each) |
| 9 | Printer | 1 | 17,000=00 |
| 10 | SCR Characteristics | 4 | 1,800-00(each) |
| 11 | UJT Characteristics Kits | 4 | 1,800-00(each) |
| 12 | BJT Characteristics | 4 | 6,200=00 (Each) |
| 13 | FET Characteristics | 4 | 5,600=00 (Each) |
| 14 | Bread Board trainers | 4 | 4,500-00(each) |
| 15 | LCR Meter | 1 | 8,000-00 (Each) |

## LABORATORY – 3:

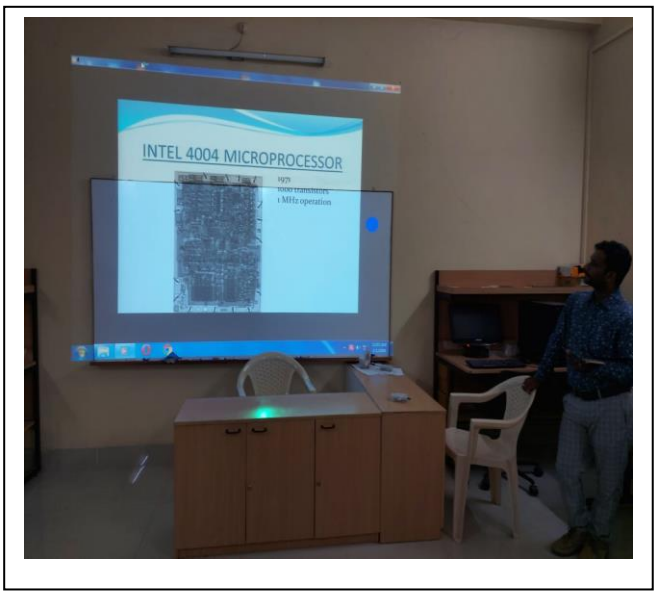
The following images shows the inner and outer view of lab-3 and which is a **Computer aided electronics lab**. This lab is mainly used for final year students. This lab is equipped with **VLSI and EMBEDDED trainer kits with the interfacing of PCs**. In this lab maximum of 30 students can perform practicals at a time.


## EQUIPMENT AVAILABLE IN THE LABORATORY – 3:

| S.No. | Name of the Equipment | Quantity available | Cost in Rupees |
|---|---|---|---|
| 1 | Dual trace Oscilloscopes (CRO) 25 MHz | 2 | 21,000=00 (each) |
| 2 | Desktop Computers | 30 | 30,000=00 (each) |
| 3 | DSP(TI-TMS320C54XX) Processor Development Kits | 6 | 12,300=00 (each) |
| 4 | VLSI Trainers (FPGA) | 6 | 17,500=00 (each) |
| 5 | Embedded Trainers | 6 | 16,500=00(each) |
| 6 | ARM 7 Trainer(Development Kits) | 6 | 15000=00 |
| 7 | Parallel port Programmers | 4 | 2,000=00 |
| 8 | Philips Flash Microcontrollers | 4 | 10,200=00 |
| 9 | PIC Microcontrollers | 1 | 7,400=00 |
| 10 | Printer | 1 | 15,000=00 |
| 11 | LPC2378 Development Kits | 4 | 21,000-00 |
| 12 | FPGA Trainer Kits | 4 | 20,200-00 |
| 13 | ARM 7 Development board (ALS-SDA-ARM-03-2148-plus) | 2 | 14,500-00 (each) |
| 14 | ARM 7 Development board (ALS-SDA-ARM-7-05) | 4 | 9,100-00 (each) |
| 15 | DSP Trainers (TMS320VC5416 based) | 4 | 21,530-00 (each) |
| 16 | Field Programmable Gate Array Trainers | 6 | 8760-00 (each) |
| 17 | MATLAB Software (Licensed) | 1 | 95,000-00 |

## LABORATORY – 4:

The following images shows the inner and outer view of lab-4, which contains **LCD projector** so there is a provision of taking **digital classes** by the teachers. This lab is mainly used for final year students. This lab is equipped with **DSP and FOC trainer kits**. In this lab maximum of 30 students can perform practicals at a time.

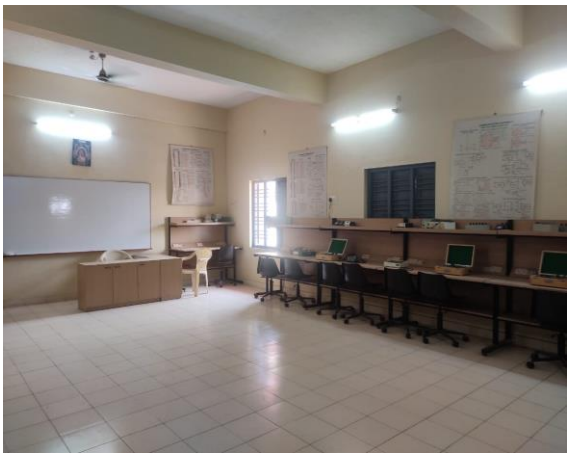



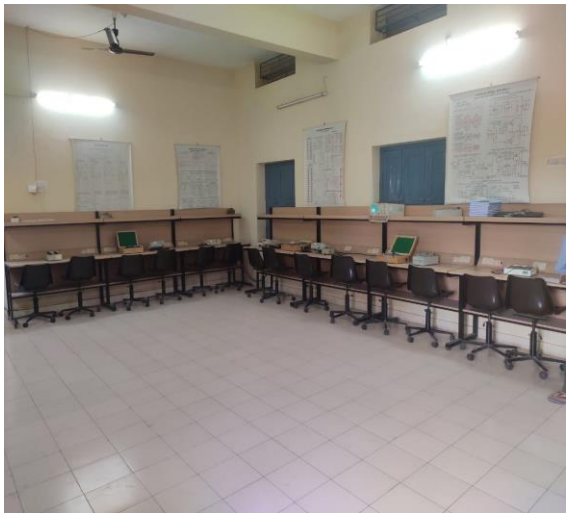

## EQUIPMENT AVAILABLE IN THE LABORATORY – 4:

| S.No. | Name of the Equipment | Quantity available | Cost in Rupees |
|---|---|---|---|
| 1 | Dual trace Oscilloscopes (CRO) 25 MHz | 4 | 14,000=00 (each) |
| 2 | Function Generators | 4 | 4000=00 (each) |
| 3 | Regulated Power supply | 6 | 850=00 (each) |
| 4 | Digital Multimeters | 4 | 1,500=00 (each) |
| 5 | Resistance Boxes | 6 | 700=00 (each) |
| 6 | Capacitance Boxes | 6 | 1,000=00 (each) |
| 7 | Desktop Computer | 1 | 30,000=00 (each) |
| 8 | FOC Trainer kits (Analog & Digital Links) | 6 | 7,200=00 (each) |
| 9 | Delta modulation Kits | 4 | 2,200=00 (each) |
| 10 | TDM Demultiplexer | 4 | 1,800=00 (each) |
| 11 | Fiber optic digital link | 2 | 14,500-00 (each) |
| 12 | Fiber optic analog link | 2 | 14,500-00 (each) |
| 13 | Function Generators (Hi-Q)Digital | 6 | 7,500-00 (each) |
| 14 | AM Modulator and Demodulators | 4 | 1,200-00(each) |
| 15 | FM Modulator and Demodulators | 4 | 1,200-00(each) |
| 16 | Phased lock loop trainer | 4 | 1,200-00(each) |
| 17 | (RPS )Power supply (0-12V) | 6 | 950-00(each) |
| 18 | Digital function generators | 4 | 12,500-00 (each) |
| 19 | Digital CROs | 4 | 18,000-00 (each) |
| 20 | Digital Multimeters | 12 | 2,100-00 (each) |

## LABORATORY – 5:

The following images shows the inner and outer view of lab-5. This lab is mainly used for second and final year students. This lab is equipped with **Microprocessor and Microcontroller kits**. In this lab maximum of 30 students can perform practicals at a time.

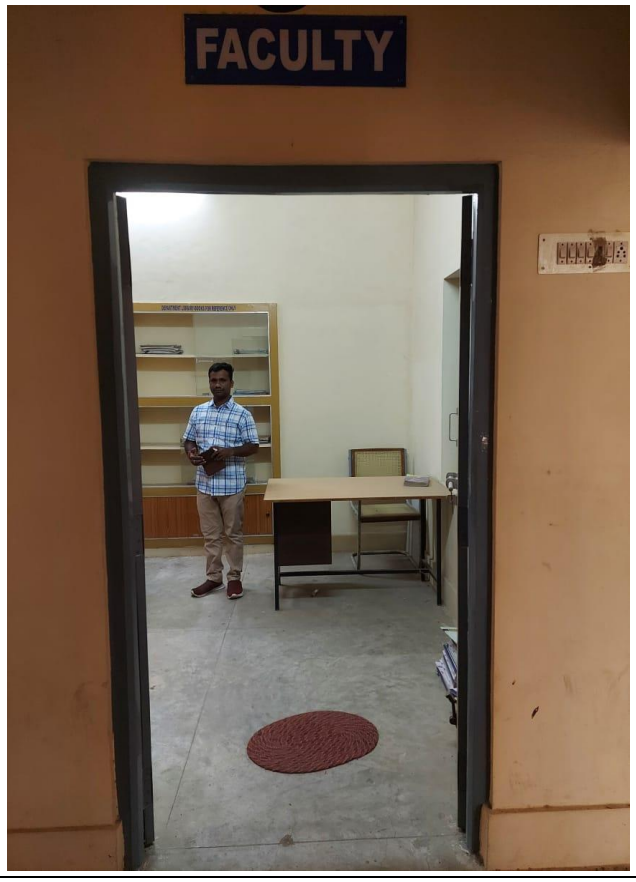



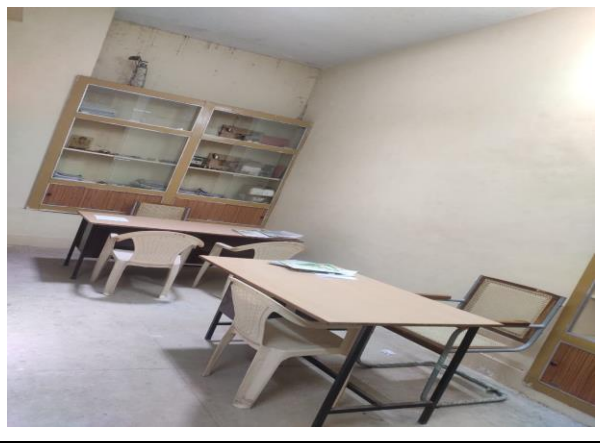


## EQUIPMENT AVAILABLE IN THE LABORATORY -5 :

| S.No. | Name of the Equipment | Quantity available | Cost in Rupees |
|---|---|---|---|
| 1 | Dual trace Oscilloscopes (CRO) 25 MHz | 3 | 16,000=00 (each) |
| 2 | Microprocessor Kits 8085 (ESA) | 10 | 3,375=00 (each) |
| 3 | Microcontrollers Development Kits (ALS& Vi Microsystems | 22 | 7,300=00 (each) |
| 4 | Digital Multimeters | 6 | 1,400=00 (each) |
| 5 | 8086 microprocessors (ESA) | 6 | 6,900=00 (each) |
| 6 | Digital LED kits | 2 | 3,500=00(Each) |
| 7 | Digital Logic Gates | 2 | 2,500=00(Each) |

## FACULTY ROOM :



## The Projects completed in the Department :

The staff and students of the department always strive to implement the innovative ideas in to reality by developing projects. The projects completed in the department are :

1. PIC Based Temperature sensor & alarm.
2. Industrial security system
3. Universal switch mode power supply (SMPS)
4. Bank token Number display.
5. Design & Implementation of 8-bit ALU using VERILOG Programme.
6. Realization of Various Counters using 8086 Microprocessor.
7. Design & Implementation of a Decimal counter.
8. Programmable amplifier –Interfaced to Parallel port of a P.C

## Design of Low cost Equipment :

The staff of the Department always strive to implement the innovative ideas in to reality by developing low cost devices which are useful for the students and teachers. Some of the low cost devices developed in the Department are

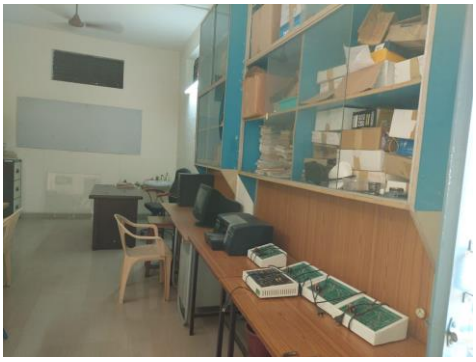
- Low cost 555 IC Timer
- Low cost 741 IC tester
- AC Live line detector
- Digital Thermometer
- LDR based light

## Design of Self Learning Kits :

We have designed many self learning kits with the available material and facilities in the department. This will help the students to perform the experiment in an easy manner. It will also save money to the college.

## Research activities of the Department :

The Correspondent of this college Sri. P.L.N. Reddy has a broader outlook and believe that the research activities are the backbone for the flourishment of any academic Institution. With his unflinching support we have started working on the following areas and progressing slowly by achieving our goal. We have also published sufficient number of papers in the journals of national and international repute.

## At present we are working on :

1. Design of Microcontroller based low cost Dielectric constant Measurement Device for Solids & Liquids
2. Wavelet transforms –Signal analysis
3. Design of 8 bit Microcontroller using VHDL / VERILOG Software.
4. Embedded system Designing

## The Department of Electronics is equipped with following Advanced equipment & Software:

- LAN associated Computer lab with 30 core 2 Duo systems
- Microprocessors Lab with 8086 LCD Processors
- Microcontrollers with interfacing facilities
- Digital Signal Processors for signal analysis (TMS320C50)
- FPGA Spartan II family board with 300K gate Xilinx Spartan device – VLSI designing
- Microcontroller based embedded board AT89C51ED2
- 89C61X2 Flash Microcontroller Board
- 89X5X embedded module
- Atmel Parallel Port Programmer
- Signal Microcontrollers (under process)
- Universal Programmer
- Digital I.C Tester
- VLSI Trainer kits
- IoT modules
- BJT, FET, PAM, PWM, Op-Amp Trainer kits
- FOC trainer kits
- MATLAB Software (Ver. 6.5) for signal analysis
- XILINX Software – VLSI Design
- MPLAB Software – PIC Microcontrollers
- Multisim 2001 – Software for circuit simulation
- Pspice (Ver 9.2) Circuit simulation software
- Embedded C Keil Software (Ver 3.0 evaluation version)
- Embedded C software (RIDE)
- ACTIVE HDL Evaluation software.
- Synapticad software
- Proteus software
- Python software


# ACTIVITIES OF THE DEPARTMENT:

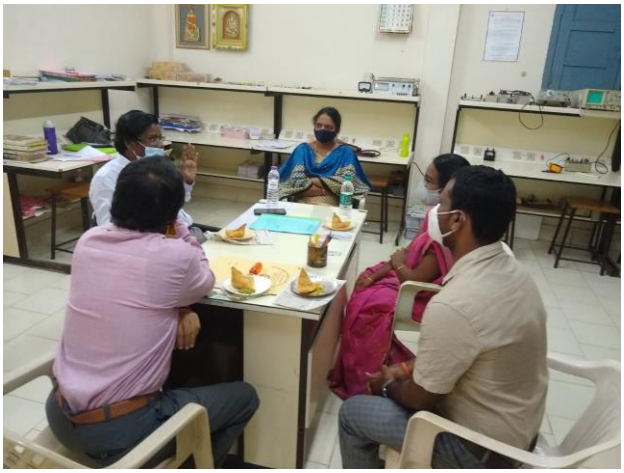
## LEARNING AND EVALUATION :

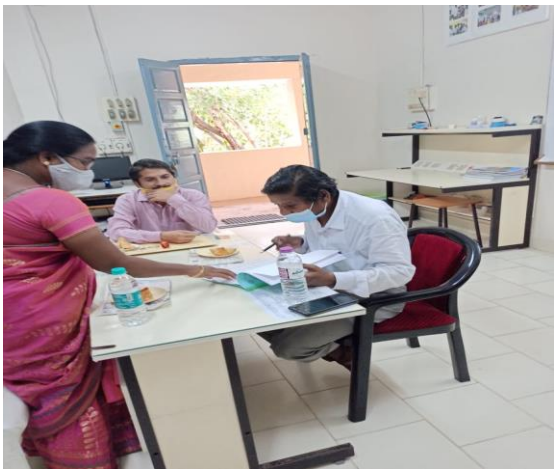
- Semester system with internal assessment component of 25% of marks and external assessment component of 75% of marks.
- Ward-tutor system in practice
- Remedial coaching offered for slow and disadvantaged learners
- Use of modern teaching aids like LCD Projectors, e-resources etc.
- Peer evaluation of assignments
- Involvement of students in study and hardware projects, seminars, assignments, quiz programs and study tours.

## BOARD OF STUDIES :

We have a distinguished BOS with senior professors from Various Universities, Industry experts and Alumni.

1) Prof. M.V. Lakshmaiah, Co-ordinator, Dept. of electronics, SK Univeristy, Anantapur.
2) Prof. D. Vishnu Vardhan, Dept. of ECE, JNTUA, Anantapur.
3) Sri. K. Prasad Reddy, DGM – Instrumentation, Chettinad Cements, Hyderabad.
4) Sri. T. Vinay Kumar Reddy, Team Lead, Tech Mahindra, Bangalore.



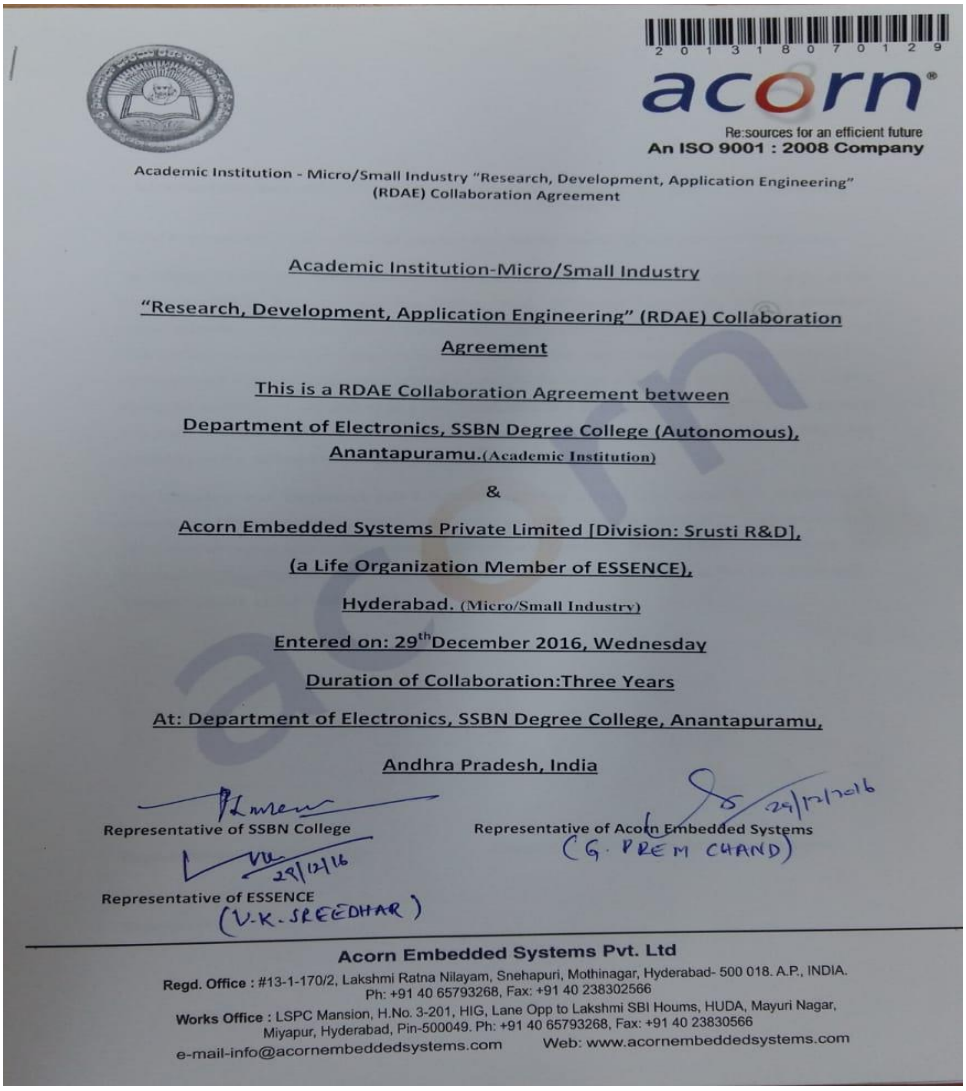


## CONSULTANCY AND LINKAGES :

The Department is actively involved in various consultancy programs like extending support to the other institutions, Industry and organizations. The department is also having linkages with the following organizations viz.

- Acorn Embedded Systems, Hyderabad.
- M/S. Hi-Q Electronics, Hyderabad.
- M/S. Sarokasoft, Hyderabad.
- Eurotech Solutions, Hyderabad and Anantapur.

The students of this Department are also given a chance for undergoing training in these organizations.



Academic Institution - Micro/Small Industry "Research, Development, Application Engineering" (RDAE) Collaboration Agreement

Academic Institution-Micro/Small Industry

"Research, Development, Application Engineering" (RDAE) Collaboration Agreement

This is a RDAE Collaboration Agreement between

Department of Electronics, SSBN Degree College (Autonomous), Anantapuramu.(Academic Institution)

&

Acorn Embedded Systems Private Limited [Division: Srusti R&D],

(a Life Organization Member of ESSENCE),

Hyderabad. (Micro/Small Industry)

Entered on: 29th December 2016, Wednesday

Duration of Collaboration:Three Years

At: Department of Electronics, SSBN Degree College, Anantapuramu,

Andhra Pradesh, India

Representative of SSBN College

Representative of Acorn Embedded Systems

(G. PREM CHAND)

29/12/2016

29/12/16

Representative of ESSENCE

(V.K. SREEDHAR)

Acorn Embedded Systems Pvt. Ltd

Regd. Office : #13-1-170/2, Lakshmi Ratna Nilayam, Snehapuri, Mothinagar, Hyderabad- 500 018. A.P., INDIA. Ph: +91 40 65793268, Fax: +91 40 238302566

Works Office : LSPC Mansion, H.No. 3-201, HIG, Lane Opp to Lakshmi SBI Houms, HUDA, Mayuri Nagar, Miyapur, Hyderabad, Pin-500049. Ph: +91 40 65793268, Fax: +91 40 23830566

e-mail-info@acornembeddedsystems.com Web: www.acornembeddedsystems.com

## SUPPORT ACTIVITIES :

The department is also actively involved in organizing seminars and workshops. Guest lectures were arranged periodically for the benefit of the students. Experts from other institutions and industry were invited.

- A 3-day Workshop entitled **" IoT Design and Web Applications"** dated 13-15th December, 2019 conducted by the Department of Electronics.

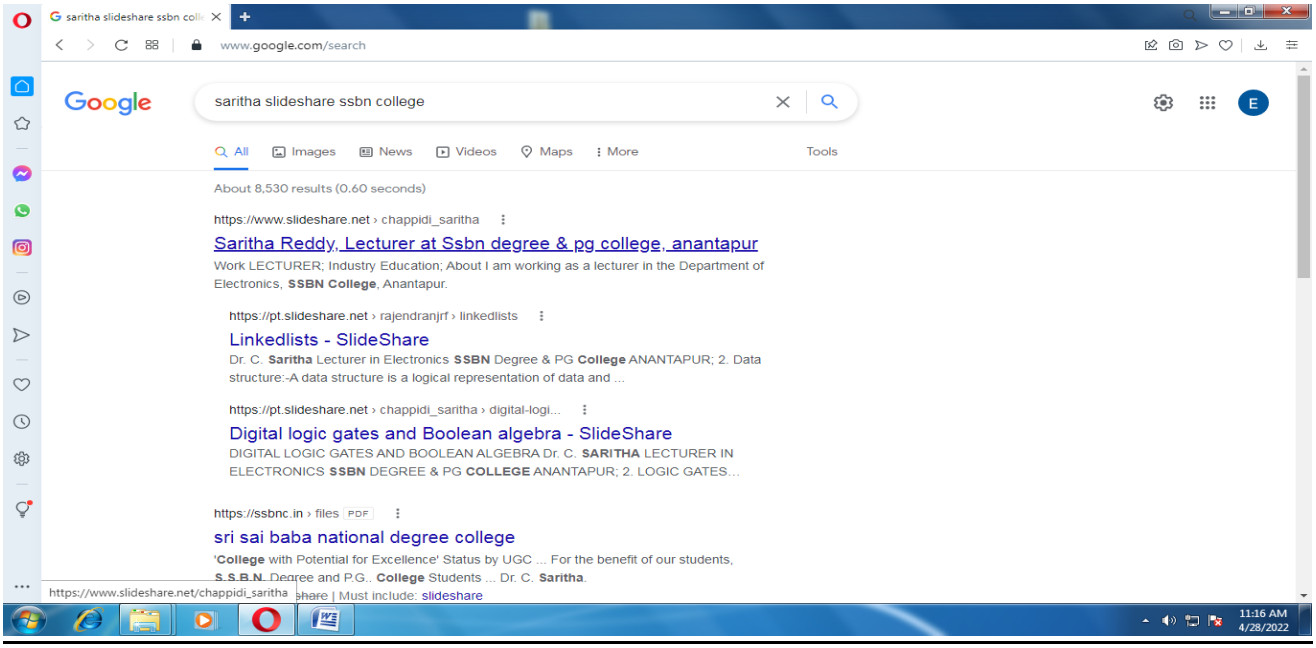
## STUDENT PROGRESSION :

The faculty of the Department takes special care in preparing the students for their higher education. **Due to the professional nature of the study** most of our students got placements while they are in final year degree.

| S.No. | Name of the Student | Course & Year of Completion | Organization/ University | Present position/Pursuing degree |
|---|---|---|---|---|
| 1 | D. Dinesh Babu | M.E.Cs. 2021 | SVU | MCA |
| 2 | B. Karthik | M.E.Cs. 2021 | SKU | B.Ed., |
| 3 | K. Naga Sai Teja | M.E.Cs. 2021 | SVU | MCA |
| 4 | G. Manideep | M.E.Cs. 2021 | Infosys | Software Engineer |
| 5 | J. Badrinath | M.E.Cs. 2021 | Infosys | Software Engineer |
| 6 | K. Chandrasekhar | M.E.Cs. 2021 | KIA | --- |
| 7 | H. Lakshmi Supriya | M.E.Cs. 2020 | Cognizant | Engineer |
| 8 | K.V. Sai Pranavi | M.E.Cs. 2020 | Wipro | Engineer |
| 9 | J.M. Trinethranath | M.E.Cs. 2019 | TCS | Software Engineer |
| 10 | K. Mounika | M.E.Cs. 2019 | Trigent Technologies | JS Developer |

## BOOKS AND STUDY MATERIAL PROVIDED BY THE DEPARTMENT:

The departmental staff is actively involved in providing the **study material and e-resources** for the benefit of students. We have prepared study material for various Entrance examinations and competitive exams. For the regular course of study also we have prepared material. This material is kept in the department and also in the internet. The students are advised to get Photostat of this material as a hardcopy or they can download the material from the internet.




## Future Plans:

We are planning to start certain new PG diploma courses which are aimed at providing employment to the students.

The courses are :

1) Medical Electronics
2) Embedded system design
3) VLSI Design

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# CURRICULUM
# FOR
# M.E.Cs

# COURSE STRUCTURE FOR MECs

| B.Sc. FIRST YEAR (M.E.Cs) ELECTRONICS (CBCS Pattern) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Title of the Course** | **Hrs./Week** | **Credits** | **CIA** | **SEA** | **Total** |
| I | Theory I | Basic Circuit Theory | **4** | **03** | **25** | **75** | **100** |
| | Practical I | Lab Course I | **2** | **02** | **10** | **40** | **50** |
| | SDC-I | Electronics in Daily Life | **2** | **2** | **20** | **30** | **50** |
| II | Theory II | Electronic Devices | **4** | **03** | **25** | **75** | **100** |
| | Practical II | Lab Course II | **2** | **02** | **10** | **40** | **50** |
| | SDC-II | Fundamentals of Data communications | **2** | **2** | **20** | **30** | **50** |

| B.Sc. SECOND YEAR (M.E.Cs) ELECTRONICS (CBCS Pattern) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Semester** | **Course** | **Title of the Course** | **Hrs./Week** | **Credits** | **CIA** | **SEA** | **Total** |
| III | Theory III | Analog circuits and communication Systems | **4** | **4** | **25** | **75** | **100** |
| | Practical III | Lab Course III | **2** | **2** | **10** | **40** | **50** |
| | SDC-III | Mobile phones & Applications | **2** | **2** | **20** | **30** | **50** |
| | SDC-IV | Electronic appliances in daily life | **2** | **2** | **20** | **30** | **50** |
| IV | Theory IV | Digital Electronics and Microprocessors | **4** | **4** | **25** | **75** | **100** |
| | Practical IV | Lab Course IV | **2** | **2** | **10** | **40** | **50** |
| | Theory-V | Microcontrollers architecture, programming & applications | **4** | **4** | **25** | **75** | **100** |
| | Practical-V | Lab Course-V | **2** | **2** | **10** | **40** | **50** |

| B.Sc. THIRD YEAR (M.E.Cs) ELECTRONICS (CBCS Pattern) | | | | | |
|---|---|---|---|---|---|
| Course | Credits | Hrs./week | CIA | SEA | Total |
| **V Semester** | | | | | |
| Paper V : Microprocessors and Applications | 4 | 3 | 25 | 75 | 100 |
| Paper VI : Electronic Communications | 4 | 3 | 25 | 75 | 100 |
| **VI Semester** | | | | | |
| **Paper VII: Common Paper**<br>Microcontrollers and Applications | 4 | 3 | 25 | 75 | 100 |
| **Paper VIII: Cluster papers**<br>VIII (A) : Embedded System Applications and Operating Systems | 4 | 3 | 25 | 75 | 100 |
| VIII (B) : VLSI Design | 4 | 3 | 25 | 75 | 100 |
| VIII (C).Project Work | 4 | 4 | 25 | 75 | 100 |
| **Lab Course** | | | | | |
| Practical paper III (Papers V, VI, & VII) | 2 | Each 2 | 40 | 120 | 160 |
| Practical paper IV ( 3 Cluster papers) | 2 | Each 2 | 40 | 120 | 160 |

**CIA: Continuous Internal Assessment** **SEA: Semester End Assessment**

**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. (M.E.Cs) Electronics – First Semester Syllabus (Under CBCS)**
**Paper I : CIRCUIT THEORY & ANALYSIS**
**(w.e.f. 2020-21)**

**UNIT- I: (12Hrs)**

**BASICS OF ALTERNATING CURRENTS:** Definition of current and voltage. General format of sine wave for voltage or current, average value, effective (R.M.S) values. J-operator, polar and rectangular form of complex numbers, phasor diagram. Differences between A.C and D.C. **(problems)**

**UNIT-II: (12hrs)**

**PASSIVE NETWORKS:**

Kirchhoff's current and Voltage Law's, Mesh Analysis, Nodal Analysis, star to delta & delta to star conversions, T and π networks – Conversions **(problems).**

**UNIT-III: (14hrs)**

**NETWORKS THEOREMS: (D.C)**

Basic terminology of Networks, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems **(problems).**

**UNIT-IV: (12hrs)**

**RC AND RL CIRCUITS:**

Transient response of RL and RC circuits with step input, Time constants, Frequency response of RC and RL circuits, their action as low pass, high pass and Band pass filters. Passive differentiating and integrating circuits **(problems).**

**SERIES AND PARALLEL RESONANCE CIRCUITS:** Series resonance and parallel resonance circuits, Q - Factor, Selectivity and band width, Comparison of series and parallel resonance, Tank circuit - LC oscillations **(problems).**

**UNIT-V: (10hrs)**

**MEASURING INSTRUMENTS**

Introduction to CRO – Parts of CRO – CRT and its working - Electron gun - Electrostatic and Magnetostatic deflections - Deflection Sensitivity - Fluorescent screen, CRO block diagram. **Applications of CRO** - Measurement of voltage, frequency and phase. Digital CRO – Block diagram explanation.

**Function generator** - Block diagram and its description.

**TEXT BOOKS:**

**1.** Introductory circuit Analysis (UBS Publications) ---- **Robert L. Boylestad.**
**2.** Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
**3.** Circuit Analysis by **P.Gnana Sivam- Pearson Education**

**REFERENCE BOOKS:**

**1.** Engineering Circuit Analysis **By: Hayt & Kemmerly - MG.**
**2.** Networks and Systems – **D.Roy Chowdary.**
**3.** Unified Electronics (Circuit Analysis and Electronic Devices) **by Agarwal-Arora**
**4.** Electric Circuit Analysis- **S.R. Paranjothi**- New Age International.

**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. (M.E.Cs) Electronics – Second Semester Syllabus (Under CBCS)**
**Paper II : ELECTRONIC DEVICES AND CIRCUITS**
**(w.e.f. 2020-21)**

**UNIT I: (12Hrs)**

**PN JUNCTION DIODES:**

P-N junction Diode - Depletion region, Barrier Potential, Junction capacitance (Definitions only), Working in Forward and Reverse bias conditions, Diode current equation (no derivation). Construction, working, V-I characteristics and simple applications of Zener diode and Tunnel diode.

**UNIT –II:(12hrs)**

**BIPOLAR JUNCTION TRANSISTOR AND ITS BIASING:** Introduction, Transistor configurations – CB, CE and CC, Comparison of CB, CE and CC. Construction and Operation of CE Configuration, Characteristics of CE – its parameters. Complete hybrid equivalent model, Transistor as a switch.

**BJT Biasing:** Fixed - Bias, Voltage - Divider Bias.

**UNIT-III:(16hrs)**

**FIELD EFFECT TRANSISTORS, UJT & SCR:**

Introduction, Construction, Operation and Characteristics of FET**/**JFET, Drain and Transfer characteristics.

**UJT construction** - working, V-I characteristics, UJT as a Relaxation oscillator.

**Silicon Controlled Rectifier (SCR):**

Structure and working of SCR. Two transistor representation, Characteristics of SCR. Application of SCR for Power control.

**UNIT IV: (08hrs)**

**PHOTO ELECTRIC DEVICES:**

Light Emitting Diodes (LEDs), IR Emitters, Photo diode, Photo transistors, Structure and operation of LDR, Opto-Isolators.

**UNIT-V:(12hrs)**

**POWER SUPPLIES:**

Rectifiers: Half wave, full wave bridge rectifiers - Efficiency and ripple factor. Types of filters - choke input (inductor) filter, shunt, L-section & π-section filters. Three terminal fixed voltage I.C. regulators (78XX and 79XX), Principle and working of SMPS (switch mode power supplies) using Block diagram.

**TEXT BOOKS:**

**1.** Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
**2.** Electronic Devices and Circuits I **– T.L.Floyd- PHI Fifth Edition**

**REFERENCE BOOKS:**

**1.** Integrated Electronics – **Millmam & Halkias.**
**2.** Electronic Devices & Circuits – **Bogart.**
**3.** Sedha R.S., A Text Book Of Applied Electronics, S.Chand & Company Ltd

**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**

# B.Sc. (MECs) Electronics –Third Semester Syllabus (Under CBCS)

## Paper III : Analog circuits and communication systems

## (w.e.f. 2021-22)

**UNIT I (12hrs)**

**OPERATIONAL AMPLIFIERS**: Introduction, Definition, Basic differential amplifier, Characteristics of an Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground.

**UNIT II (12hrs)**

**Op-amp Circuits:**

Summing amplifier, difference amplifier, voltage follower, op-amp parameters, voltage to current converter, integrator, differentiator, Logarithmic amplifier. comparator, Instrumentation amplifier.

**UNIT III (12hrs)**

**OP-AMP Wave form generators**: - Astable Multivibrator, Schmitt trigger. Sine wave generator, Square wave generator.

Active Filters (Introduction) - low pass, high pass filters. IC-555 –functional block diagram and it's applications.

**UNI T – IV**

**Modulation and Detection (10)**

Introduction - Need for modulation. Types of Modulations - Amplitude modulation, Analysis of amplitude modulated wave, side bands, simple amplitude modulator circuit and its working. Detection of AM Waves, draw backs of amplitude modulation.

**UNI T –V**

**Frequency Modulation and Detection (10)**

Introduction - Frequency modulation and analysis, working of a simple frequency modulator (reactance modulator). Detection of FM wave using double tuned discriminator, Advantages of FM over AM and differences between AM and FM.

**TEXT BOOKS:**


1. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
2. Linear Integrated Circuits By Roy Choudary
3. Microelectronics: Jacob Millman & Arvin Grabel,. 2 nd Ed., TMH, 1999
4. Electronic Communications: Kennedy, TMH


**REFERENCE BOOKS:**


1. Modern Electronics Communications: Gray and Miller

**ELECTRONICS LAB -3**

**ELECTRONIC COMMUNICATIONS LAB**

**(Any six experiments should be done)**

1. Study of Amplitude Modulation and Demodulation.
2. Study of Frequency Modulation and Demodulation
3. Study of Pulse Amplitude Modulation
4. Study of Pulse Width Modulation
5. Study of Pulse Position Modulation
6. Study of Pulse Code Modulation
7. Verification of Logic gates
8. Code conversions : BCD to Gray and Gray to BCD
9. Realization of RS and D flip-flops
10. Construction of a Half adder and Full adder
11. Realization of a 8:1 Multiplexer and 1:16 Demultiplexer
12. Construction of a Parallel Binary Adder

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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**

**DEPARTMENT OF ELECTRONICS**

**B.Sc. Electronics –Fourth Semester Syllabus (Under CBCS)**

**Paper IV : Digital Electronics & Microprocessors architecture -Applications**

**(w.e.f. 2021-22)**

**UNIT- I (12 hrs)**

**NUMBER SYSTEMS AND BOOLEAN ALGEBRA :**Decimal, binary, Hexadecimal, octal, conversion from one to another, Digital codes - BCD, gray code & conversions. Binary addition and subtraction (1's,2's Complement methods), ASCII code.

**UNIT II (12 Hrs)**

**COMBINATIONAL CIRCUITS & LOGIC FAMILIES :** Logic gates(AND,OR,NOT,XOR) Universal logic gates - De Morgan's Theorems.

Arithmetic Building blocks - Half & Full Adders. Multiplexers (2:1, 4:1), De-multiplexers (1:2, 1:4), Encoder (8 line to 3 line encoder), Decoder (3 line to 8 line decoder).

**UNIT - III(12 hrs)**

**SEQUENTIAL DIGITAL CIRCUITS:** Flip-flops : RS, JK, D Flip flops . Registers: Shift left register , shift right register, Counters : Asynchronous counters- Mod 16, Mod 10 (Decade counter)synchronous counters (Mod-16)

**MEMORY DEVICES :**General Memory Operations, ROM –Architecture , RAM-Architecture.

**UNIT- IV (12 hrs)**

**ARCHITECTURE OF 8085 MICROPROCESSOR:**

Intel 8085 Microprocessor – Block diagram and its detailed study - central processing unit (CPU) – arithmetic and logic unit (ALU) – timing and control unit – register organization – address, data and control buses - pin configuration of 8085 and its description. Interrupt Structure.

**UNIT- V (12 hrs)**

**PROGRAMMING AND APPLICATIONS** : Instruction set, Addressing modes. Addition & subtraction (8-bit and 16-bit), multiplication, division, Binary to BCD, BCD to Binary.

Programmable Peripheral Devices (8255) - Pin functions, Different Modes & Block Diagram, Binary counter (00-FF), Stepper motor control interface.

**TEXTBOOKS**


1. M.Morris Mano, " Digital Design " 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV )
3. Ramesh S. Gaonakar, Microprocessor Architecture, Programming and Application with the8085-PenramLnternational Publishing, Mumbai.
4. Ram, Fundamentals of microprocessors and microcomputers - Dhanpat Rai Publications, New Delhi


**REFERENCE BOOKS**


1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985.
2. S.K. Bose. "Digital Systems". 2/e. New Age International. 1992.
3. Mathur A.P., Introduction to Microprocessors. (3rd edn., Tata McGraw, New Delhi.
4. Leventhal L.A., Microprocessor Organisation and Architecture, Prentice Hall India.


## ELECTRONICS LAB - 4

**(Digital and Microprocessors Lab)**
**(Any six experiments should be done)**

1. Verification of logic gates.
2. Code conversions (Binary to gray & gray to binary)
3. Half adder
4. Multiplexer (8:1) and Demultiplexer (1:8)
5. Addition & Subtraction (8 & 16-bits)
6. Multiplication & Division (8 - bit)
7. Stepper motor interface(Clock wise & anti clockwise)
8. Binary counter interface(00-FF)

**LAB MANUAL**


1. Zbar, Malvino and Miller, Basic Electronics, A Text Lab Manual, Tata McGraw Hill.
2. Sugaraj Samuel R., Horsley Solomon, B.E.S. Practicals.
3. Microprocessor lab premier by K.A.Krishnamurthy

**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**

**DEPARTMENT OF ELECTRONICS**

**B.Sc. THIRD YEAR (M.E.Cs) ELECTRONICS (CBCS Pattern)**

# Paper V: MICROCONTROLLERS AND APPLICATIONS

**(w.e.f. 2021-22)**

**UNIT– I :**

**Introduction to Microcontrollers :** Microprocessors and Microcontrollers, comparison between Microprocessors & Microcontrollers, Evolution of Microcontrollers from 4- bit to 32-bit. Development tools for microcontrollers – assembler – compiler – simulator/debugger.

**UNIT-II : Microcontroller Architecture:**

Overview and block diagram of 8051. Architecture of 8051. Program counter and memory organization. Data types and directives, Flag bits and PSW Register, Register banks and Stack; Pin diagram of 8051, Port organization, Interrupts and timers.

**UNIT–III : Addressing modes, instruction set and assembly language programming of 8051**

Addressing modes and accessing memory using various addressing modes. Instruction set: Arithmetic, Logical, Single Bit, Jump, Loop and Call Instructions and their usage. Time Delay Generation and Calculation; Timer/Counter Programming. Programming examples: Addition, multiplication, subtraction, division, arranging a given set of numbers in ascending / descending order.

**UNIT – IV: Interfacing and Applications of Microcontroller**

Interfacing of - PPI 8255, DAC, ADC. Temperature measurement, displaying information on a LCD, Control of a Stepper Motor, Interfacing a keyboard. generation of different types of waveforms using DAC.

**UNIT – V: Introduction to PIC Microcontrollers:**

Overview of PIC 16CXX family microcontroller, Architecture of 16C8X PIC microcontroller-ALU,W-register, Status register, FSR register, Watchdog timer, Stack and Program counter, Memory Organization, I/O Ports, Timers, Pin description of PIC16C8X.

**Reference books:**


1. The 8051 microcontroller and embedded systems using assembly and c – Kennet J. Ayala, Dhananjay V. Gadre, cengage publishers
2. The 8051 Microcontrollers and Embedded Systems – By Muhammad Ali Mazidi and Janice Gillispie Mazidi- Pearson Education Asia, 4th Reprint, 2002.
3. Microcontrollers – Theory and applications by Ajay V. Deshmukh-Tata McGraw-Hill

4. PIC Microcontroller and Embedded Systems using Assembly and C for PIC- Muhammad Ali Mazidi-Pearson Edition.
4. The concepts & features of Microcontrollers by Rajkamal - Wheeler Pub

**ELECTRONICS LAB – 5**

**Microcontrollers LAB**

**(Any six experiments should be done)**

1. Multiplication of two numbers using MUL command (Later using counter method for repeated addition).
2. Division of two numbers using DIV command (Later using counter method for repeated subtraction).
3. Pick the largest/ number among a given set of numbers.
4. Pick the smallest number among a given set of numbers.
5. Arrange an array of numbers in ascending orders
6. Arrange an array of numbers in descending orders
7. Interface a DAC & Generate a square wave.
8. Interface stepper motor and rotate Clock wise and Anti clockwise through given angle step.

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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics –Fifth Semester Syllabus (Under CBCS)**
**Paper V : MICROPROCESSORS AND APPLICATIONS (INTEL 8085)**
**(w.e.f. 2020-21)**

**UNIT- I (12 hrs)**

**ARCHITECTURE OF 8085 MICROPROCESSOR:**

Intel 8085 Microprocessor – Block diagram and its detailed study - central processing unit (CPU) – arithmetic and logic unit (ALU) – timing and control unit – register organization – address, data and control buses - pin configuration of 8085 and its description. Interrupts - Priority Concept.

**UNIT - II (12 hrs)**

**INSTRUCTION SET OF 8085:** Instruction set classification - addressing modes

**MEMORY** - Instruction cycle - machine cycle - T-state -Timing diagrams for Op-code Fetch Cycle, Memory Read, Memory Write, I/O Read and I/O Write.

**UNIT- III (12 hrs)**

**PROGRAMMING 8085:** Addition & subtraction (8-bit and 16-bit), multiplication, division, largest, smallest, block data transfer (all 8-bit data), Binary to BCD, BCD to Binary, Stack & Subroutines Concept - time delay using single and double registers.

**UNIT- IV (12 hrs)**

**INTERFACING MEMORY:** 2K X 8, 4K X 8 ROM, RAM to 8085, Interfacing an I/O port in Memory Mapped I/O and I/O Mapped I/O - Difference between I/O mapped and Memory Mapped I/O.

**UNIT - V (12 hrs)**

**MICROPROCESSOR APPLICATIONS:** Programmable Peripheral Devices (8255) - Pin functions, Different Modes & Block Diagram, Programmable Interval Timer (8253/54) – Block diagram and pin description, Temperature measurement using ADC, Wave form generation using DAC, Stepper motor control interface.

**TEXTBOOKS**

1. Ramesh S. Gaonakar, Microprocessor Architecture, Programming and Application with the8085-PenramLnternational Publishing, Mumbai.
2. Ram, Fundamentals of microprocessors and microcomputers - Dhanpat Rai Publications, New Delhi
3. Microprocessors & Microcontrollers by N .Senthilkumar, M. Saravanan& S. Jeevananthan, 1st
edition, Oxford press(Helpful for interfacing applications)
4. Microprocessors & Microcontrollers by B.P.Singh, Galgotia publications Pvt.Ltd.

**REFERENCE BOOKS**

1. Mathur A.P., Introduction to Microprocessors. (3rd edn., Tata McGraw, New Delhi,
2. Leventhal L.A., Microprocessor Organisation and Architecture, Prentice Hall India.
3. Microprocessor lab premier by K.A.Krishnamurthy

**ELECTRONICS LAB - 5**
**(MICROPROCESSORS LAB)**
**(Any six experiments should be done)**

**Programs using Intel 8085**

1. Addition & Subtraction (8 & 16-bits)
2. Multiplication & Division (8 - bit)
3. Largest & Smallest number in the given array.
4. Ascending & Descending order.
5. Binary to BCD and BCD to Binary.
6. Block Transfer of Data.
7. Waveform generation using DAC interface.
8. Stepper motor interface.

**LAB MANUAL**


1. Zbar, Malvino and Miller, Basic Electronics, A Text Lab Manual, Tata McGraw Hill.
2. Sugaraj Samuel R., Horsley Solomon, B.E.S. Practicals.
3. Vijayendran V., Fundamentals of microprocessor-8085, S.Viswanathan Publishers Chennai-3


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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics –Fifth Semester Syllabus (Under CBCS)**
**Paper VI : ELECTRONIC COMMUNICATIONS**
**(w.e.f. 2020-21)**

**UNIT- I (12 hrs) : BASICS OF COMMUNICATION SYSTEMS AND NOISE**

Block diagram of communication system, Types of Electronic Communication systems: Simplex, half duplex and Duplex. Analog / Digital Signals. Noise in communication: External noise -Atmospheric, space noise, man-made noise, internal noise- Thermal, Shot noise. Definitions and relationship between Bit rate, Baud rate, Bandwidth and signal to Noise Ratio.

**UNIT - II (12 hrs) : AMPLITUDE MODULATION**

Need for modulation, Amplitude modulation, Modulation index, frequency spectrum, generation and analysis of AM, Amplitude Demodulation (diode detector), other forms of AM: Double side band suppressed carrier (DSBSC), Single side band suppressed carrier – generation and analysis (SSBSC), Vestigial side band system (VSB).

**UNIT- III (12 hrs) :ANGLE MODULA TION**

Frequency and phase modulation - Analysis, modulation index and frequency spectrum, relation between FM and PM (generation of FM from PM and PM from FM), FM Modulator, FM detector. Comparison between AM and FM .

**UNIT- IV (12 hrs) :TRANSMITTERS & RECEIVERS**

**Transmitters:** Communication channels for AM and FM broadcast, AM transmitter: Low level and high level modulation, FM transmitter.

**Receivers:** Receiver parameters- sensitivity, selectivity and fidelity, Super Heterodyne receiver, FM receivers. Frequency division multiplexing.

**UNIT - V (12 hrs) : DIGITAL COMMUNICATION**

Sampling theorem, Pulse Amplitude Modulation (PAM), Time Division Multiplexing (TDM), Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM), Pulse Code Modulation, Differential Pulse Code Modulation, Delta Modulation.

**TEXTBOOKS**


1. H. Taub and D. Schilling, Principles of Communication Systems, Tata McGraw-Hill (1999)
2. W. Tomasi, Electronic Communication Systems: Fundamental through Advanced, Pearson Education (2004)
3. L. E. Frenzel, Communication Electronics, Principle and Applications, Tata Mcgraw-Hill (2002)
4. L. W. Couch II, Digital and Analog Communication Systems, Pearson Education (2005)


**REFERENCE BOOKS**


1. S. Haykin, Communication Systems, Wiley India (2006)
2. G. Kennedy and B. Davis, Electronic communication systems, Tata McGraw Hill (1999)

3. R. P. Singh and S. D. Sapre, Communication Systems: Analog and Digital, Tata McGraw Hill (2007)
5. T.G. Thomas and S. Chandra Sekhar, Communication theory, Tata McGraw Hill (2006)

## ELECTRONICS LAB - 6

## ELECTRONIC COMMUNICATIONS LAB

**(Any six experiments should be done)**

1. Study of Amplitude Modulation and Demodulation.
2. Study of Frequency Modulation and Demodulation
3. Study of Pulse Amplitude Modulation
4. Study of Pulse Width Modulation
5. Study of Pulse Position Modulation
6. Study of Pulse Code Modulation
7. Simulation of AM modulation and Demodulation using software.
8. Simulation of FM modulation and Demodulation using software.

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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS) :: ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics – Sixth Semester Syllabus (Under CBCS)**
**Paper VII: MICROCONTROLLERS AND APPLICATIONS**
**(w.e.f. 2020-21)**

**UNIT– I :**

**Introduction to Microcontrollers :** Microprocessors and Microcontrollers, comparison between Microprocessors & Microcontrollers, Evolution of Microcontrollers from 4- bit to 32-bit. Development tools for microcontrollers – assembler – compiler – simulator/debugger.

**UNIT-II : Microcontroller Architecture:**

Overview and block diagram of 8051. Architecture of 8051. Program counter and memory organization. Data types and directives, Flag bits and PSW Register, Register banks and Stack; Pin diagram of 8051, Port organization, Interrupts and timers.

**UNIT–III : Addressing modes, instruction set and assembly language programming of 8051**

Addressing modes and accessing memory using various addressing modes. Instruction set: Arithmetic, Logical, Single Bit, Jump, Loop and Call Instructions and their usage. Time Delay Generation and Calculation; Timer/Counter Programming. Programming examples: Addition, multiplication, subtraction, division, arranging a given set of numbers in ascending / descending order.

**UNIT – IV: Interfacing and Applications of Microcontroller**

Interfacing of - PPI 8255, DAC, ADC. Temperature measurement, displaying information on a LCD, Control of a Stepper Motor, generation of different types of waveforms using DAC.

**UNIT – V: Introduction to PIC Microcontrollers:**

Overview of PIC 16CXX family microcontroller, Architecture of 16C8X PIC microcontroller-ALU,W-register, Status register, FSR register, Watchdog timer, Stack and Program counter, Memory Organization, I/O Ports, Timers, Pin description of PIC16C8X.

**Reference books:**


1. The 8051 microcontroller and embedded systems using assembly and C – Kennet J. Ayala, Dhananjay V. Gadre, cengage publishers
2. The 8051 Microcontrollers and Embedded Systems – By Muhammad Ali Mazidi and Janice Gillispie Mazidi- Pearson Education Asia, 4th Reprint, 2002.
3. Microcontrollers – Theory and applications by Ajay V. Deshmukh-Tata McGraw-Hill

4. PIC Microcontroller and Embedded Systems using Assembly and C for PIC- Muhammad Ali Mazidi-Pearson Edition.
5. The concepts & features of Microcontrollers by Rajkamal - Wheeler Pub

**ELECTRONICS LAB – 7**

**Microcontrollers LAB**

**(Any six experiments should be done)**

1. Multiplication of two numbers using MUL command (Later using counter method for repeated addition).
2. Division of two numbers using DIV command (Later using counter method for repeated subtraction).
3. Pick the largest/ number among a given set of numbers.
4. Pick the smallest number among a given set of numbers.
5. Arrange an array of numbers in ascending orders
6. Arrange an array of numbers in descending orders
7. Interface a DAC & Generate a square wave.
8. Interface stepper motor and rotate Clock wise and Anti clockwise through given angle step.

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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics – Sixth Semester Syllabus (Under CBCS)**
**CLUSTER PAPER VIII – A : Embedded System Design and RTOS**
**(w.e.f. 2020-21)**

**UNIT-I: Introduction to embedded systems:**

Definition and Characteristics of an embedded system, Categories of embedded systems – Stand alone embedded systems, Real-time embedded systems, Networked information appliances, Mobile devices, Specialties of embedded systems - Reliability, Performance, Power Consumption, Cost, Size, Limited user interface and Software up gradation capability. Recent trends in embedded systems – Processor Power, Memory, Operating Systems, Communication interfaces and networking capability, programming languages, development tools, programmable hardware, and Application areas of an embedded system.

**UNIT-II: Architecture of embedded systems:**

Overview of an embedded system **a**rchitecture, Simplified Hardware architecture of an embedded system – Central processing unit (CPU), Memory, Input / Output devices, Communication interfaces and Application specific circuitry. Operating System – Definition and functions, Categories of embedded operating Systems. Services provided by an embedded operating system – Reliability, Multi tasking with time constraints, Small footprint, Support for diskless systems, Portability, Scalability and Support for standard API, Architecture of an embedded operating system.

**UNIT-III: Programming in C for Embedded Systems :**

Use of High level language like 'C', Memory constitution in 8051, Constants, Variables and data types, Stack in 8051, Modules and programs, Programming build process (generating an executable image). Introduction to Keil C compiler and its features, Programming examples by using Keil C compiler: Toggling of Port bits, Realization of binary counter and BCD counter, Conversion of ASCII characters into Hex by using serial port, Finding the largest and smallest number in an array, Arranging an array of numbers in ascending and descending orders.

**UNIT-IV: Embedded / Real time Operating System Concepts**

Architecture of the kernel, Tasks, Task states and Task scheduling algorithms, Interrupt service routines, Management Function calls of Semaphores, Mutex, Mailboxes, Message Queues, Event registers, Pipes, Signals, Timers. Memory management and Priority inversion problem.

**UNIT-V: Programming in Linux**

Overview of Unix/ Linux - Features of Linux, Linux commands, File manipulation commands, Editors, Directory commands, Input/output redirection, Pipes and Filters, File protections, Process commands.

**Reference books:**


1. Embedded/Real time systems-concepts, design and programming, Dr. K.V.K.K. Prasad, dreamtech press.
2. The 8051 microcontroller and embedded systems using assembly and c – Kennet J. Ayala, Dhananjay V. Gadre, cengage publishers
3. The 8051 Microcontrollers and Embedded Systems – By Muhammad Ali Mazidi and Janice Gillispie Mazidi- Pearson Education Asia, 4th Reprint, 2002
4. Embedded systems by Rajkamal, TMH.


## ELECTRONICS LAB – 8(A)

## Embedded Systems Lab

**(Any six experiments should be done)**

1. Using KEIL software, write a program to pick the smallest among a given set of numbers.
2. Using KEIL software, write a program to pick the largest among a given set of numbers.
3. Using KEIL software, write a program to generate a rectangular waveform at a specified port terminal.
4. Using KEIL software, write a program to arrange an array of numbers in ascending order by using serial port
5. Using KEIL software, write a program to arrange an array of numbers in descending order by using serial port
6. Using KEIL software, write a program to realize a Binary counter
7. Using KEIL software, write a program to toggle the port bits
8. Using KEIL software, write a program to conversion of ASCII characters in hex

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**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics – Sixth Semester Syllabus (Under CBCS)**
**Paper VIII (B) : VLSI DESIGN**
**(w.e.f. 2020-21)**

**UNIT-I .Introduction to VLSI Design**

VLSI Technology Fundamentals, Applications, Overview .What is a chip? Requirements of a successful chip design, Evolution of Integration levels-VLSI Design Process-VLSI Design Methodology-Electronic Design Automation (EDA)-ASIC and FPGA design flow (Brief ideas only).

**Books: (i).VLSI Design , Black Book-KVKK Prasad, Dreamtech Publishers.**

**(ii).VLSI Circuit Design Methodology Demystified-Liming Xiu,IEEE Press.**

**UNIT-II CMOS VLSI Design**: MOS technology and Fabrication Process-Basic MOS Transistor Operation- Enhancement Mode Transistor Action-Depletion Mode Transistor Action

nMOS Fabrication, CMOS Fabrication, The p-well Process , The n-well Process , The Twin-Tub Process, Silicon on Insulator(SOI)

**Book: (i).VLSI Design , Black Book-KVKK Prasad, Dreamtech Publishers .**

**UNIT-III : BASIC MOS and BiCMOS Circuits and Design Process.**

NMOS Inverter – CMOS Inverter-BiCMOS- inverter- Latch-up in CMOS Circuits - MOS Layers-Stick Diagrams - nMOS Design Style - CMOS Design Style - Design Rules and Layout - Lambda-based Design Rules .

**Book (i). Basic VLSI Design –Pucknell & Kamran PHI Publishers**

**UNIT-IV- Hardware Description Languages**

Overview of VHDL and Verilog – Code structure, Logical, Relational, Arithmetic, shift and Rotate operators-Data types . Implementation of simple logic gates, half adder, Comparator Multiplexer.

Book (i): HDL Programming Vhdl and Verilog- By Nazeih M. Botros,DreamTech

**UNIT-V- The Challenges in VLSI circuit Design**

Role of functional verification in the IC design process. The design integrity issues. Design for Testability- Reducing the chip's power consumption -Challenges in chip packaging-Advantages of design reuse. Hardware/software co-design.

Clock –Significance. Leakage current problem. Design for manufacturability. Chip reliability. Role of EDA tools in IC design.

**Book: VLSI Circuit Design Methodology Demystified-Liming Xiu,IEEE Press.**

**Text Books:**

(i) VLSI Design, Black Book-KVKK Prasad, Dreamtech Publishers.

(ii).VLSI Circuit Design Methodology Demystified-Liming Xiu,IEEE Press.

(iii).Introduction to VLSI Circuits and Systems –J.P.Uyemura –Wiley Publishers.

(iii).HDL Programming Vhdl and Verilog- By Nazeih M. Botros,DreamTech.

**Reference Books:**

(i).CMOS Digital Integrated Circuit Analysis & Design- by Sung-Mo (Steve) Kang,& Yusuf Leblebici

(iii).CMOS VLSI Design –Weste and Harris -Pearson

(ii).Basic VLSI Design –Pucknell & Kamran PHI Publishers.

(iii).VLSI Design,-Albert Raj –PHI Learning

(iv).Verilog HDL Primer –J.Bhasker –B.S Publications

**ELECTRONICS LAB – 8(B)**

**VLSI DESIGN LAB**

**(Any Six experiments should be done)**

1. Study of Simulation using tools.
2. Design entry and simulation of combinational logic circuits A) Basic Logic gates B) Half & Full adders C) Half and Full Subtractor D) 8 bit Adder
3. Design entry and simulation of combinational logic circuits E) 4 bit Multiplier F) Encoder and Decoder G) Address Decoder H) Multiplexer.
4. Design entry and simulation of sequential logic circuits A) Flip-Flops B) Counter.
5. Study of Synthesis tools.
6. Place, route and back annotations for FPGAs.
7. Schematic entry and spice Simulation A) CMOS Inverter B) Universal Gate C) Differential Amplifier.
8. Layout of CMOS Inverter.

**S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS): ANANTAPUR**
**DEPARTMENT OF ELECTRONICS**
**B.Sc. Electronics – Sixth Semester (Under CBCS)**
**Paper VIII A/B/C: PROJECT WORK**
**(w.e.f. 2020-21)**

The main objective behind introducing the Project work to the Final Year B.Sc students is to motivate and Inspire them to get hands on experience and keep abreast themselves with contemporary emerging technologies in the industry. This should enable them to enhance their problem solving skills and improve their abilities to work in a team and to understand the needs and culture of the industry environment so that they can become good professionals.

The project duration is one semester and every week the student is supposed to spend 4 hours on this work. The project guide will be one of the faculties from the department and he/she helps the students by properly guiding them in selecting the project and planning and implementation.At the end of the course the project dissertation must be submitted by the student with the permission of the Guide/Head.

The Maximum marks for the project is 75 and 25 will be for project review submission or presentation during the project time.

**Distribution of Marks is as follows.**

| **S.No** | **Work** | **Maximum Marks** | **Minimum Pass marks** |
|---|---|---|---|
| 1 | Mid-term Presentation /Internal Evaluation | 25 | |
| 2 | Dissertation(Book) | 20 | |
| 3 | Project work( quality of work) | 25 | |
| 4 | Power point Presentation/Demonstration of the project at the end | 15 | |
| 5 | Comprehensive Viva-voce | 15 | |
| Total | | 100 | 40 |