S.S.B.N. DEGREE COLLEGE

(AUTONOMOUS)

ANANTAPURAMU – 515 001

DEPARTMENT
OF
INDUSTRIAL ELECTRONICS

DEPARTMENTAL PROFILE

SRI SAIBABA NATIONAL DEGREE COLLEGE::ANANTAPUR
(Autonomous)
Department of Industrial 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 INDUSTRIAL 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 Industrial Electronics has a humble beginning with **U.G. course (M.IE.Cs)** in the year 2018 with an intake of 60 students. The main intention of introducing this course is **to make the students for the current industrial requirements.**

This Department of Industrial 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 Industrial 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)
8. Embedded Processor based automatic temperature control of VLSI Chips J. Sensors & Transducers, Vol.100,Issue1,January,2009,pp:27-44
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10. "Embedded based digital counters" , J. Lab Experiments, Vol 15, No-3, Sep-2015.

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- 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

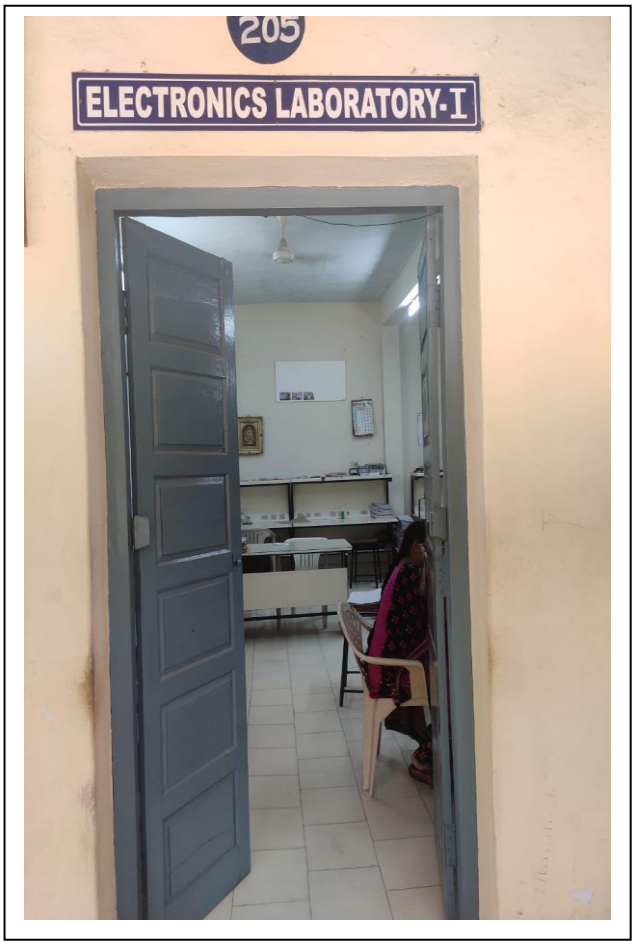
Infrastructure Facilities :

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:

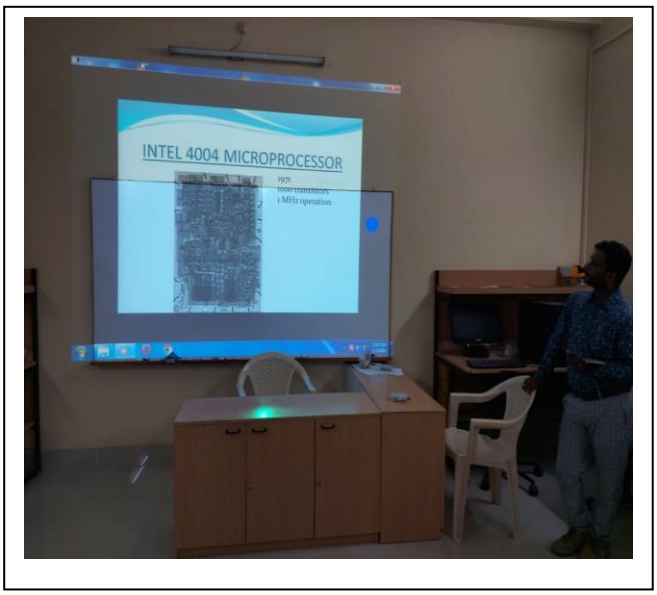
The following images shows the inner and outer view of lab-3 and which is a **Computer aided electronics lab**. This lab is mainly used for final year students. This lab is equipped with **VLSI and EMBEDDED trainer kits with the interfacing of PCs**. In this lab maximum of 30 students can perform practicals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

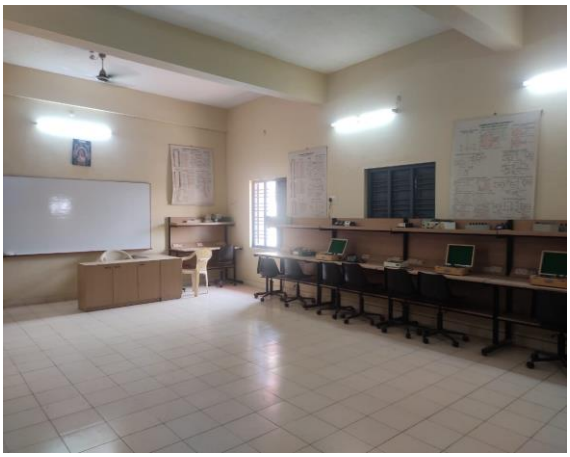


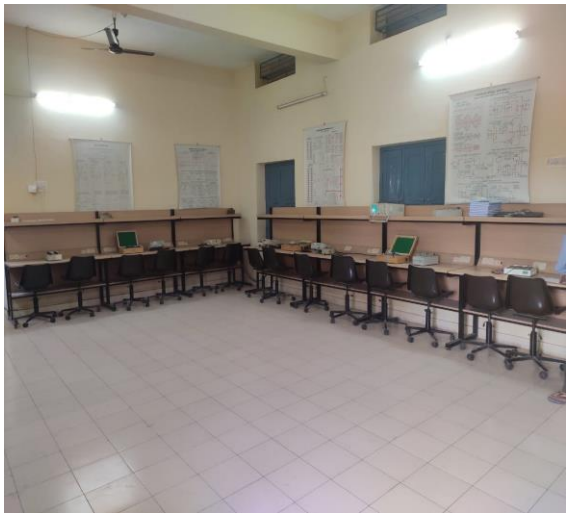
EQUIPMENT AVAILABLE IN THE LABORATORY – 4:

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.

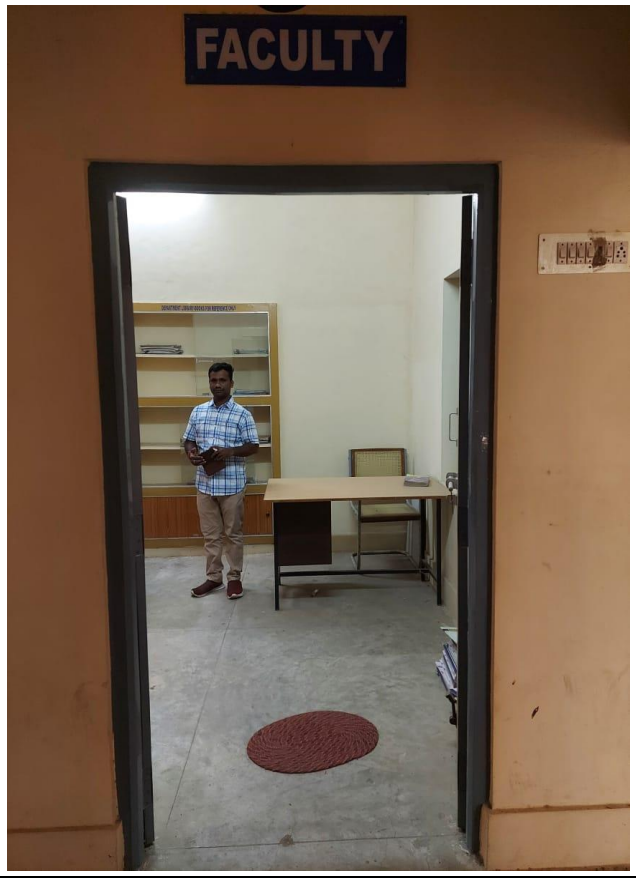


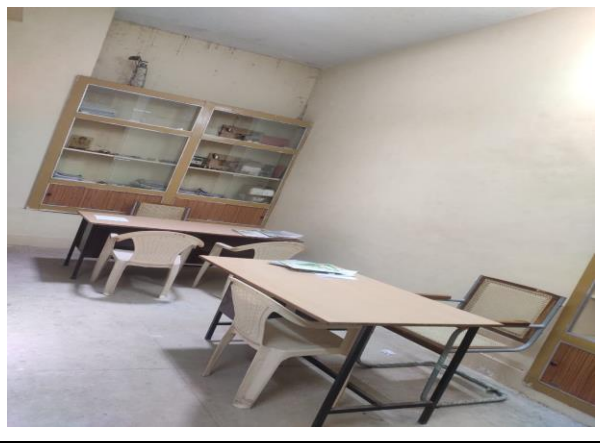


EQUIPMENT AVAILABLE IN THE LABORATORY -5 :

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

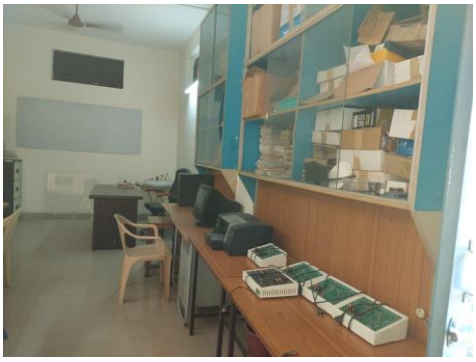
- Low cost 555 IC Timer
- Low cost 741 IC tester
- AC Live line detector
- Digital Thermometer
- LDR based light

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 Deaprtment :

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 Industrial Electronics is equipped with following 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:

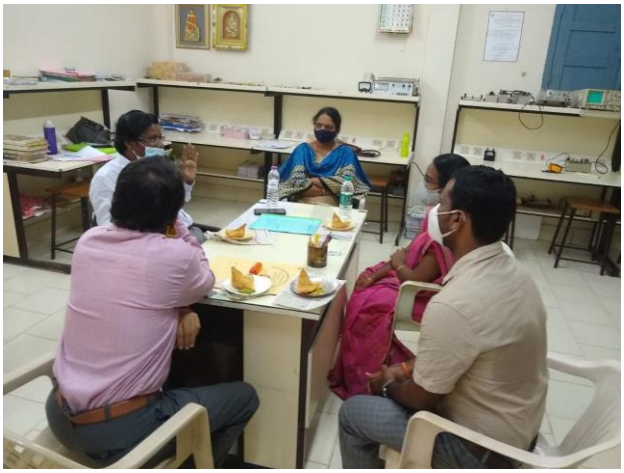
LEARNING AND EVALUATION :

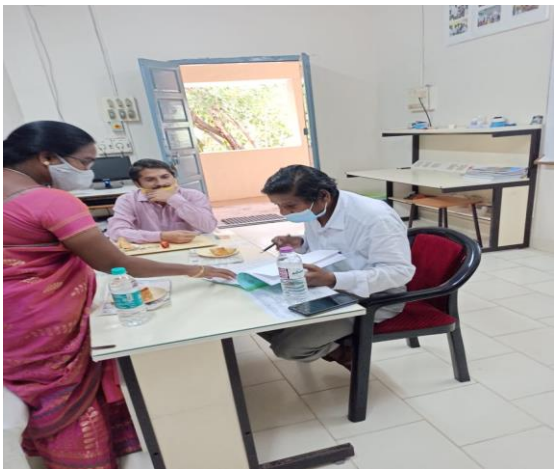
- Semester system with internal assessment component of 25% of marks and external assessment component of 75% of marks.
- Ward-tutor system in practice
- Remedial coaching offered for slow and disadvantaged learners
- Use of modern teaching aids like LCD Projectors, e-resources etc.
- Peer evaluation 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.

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.

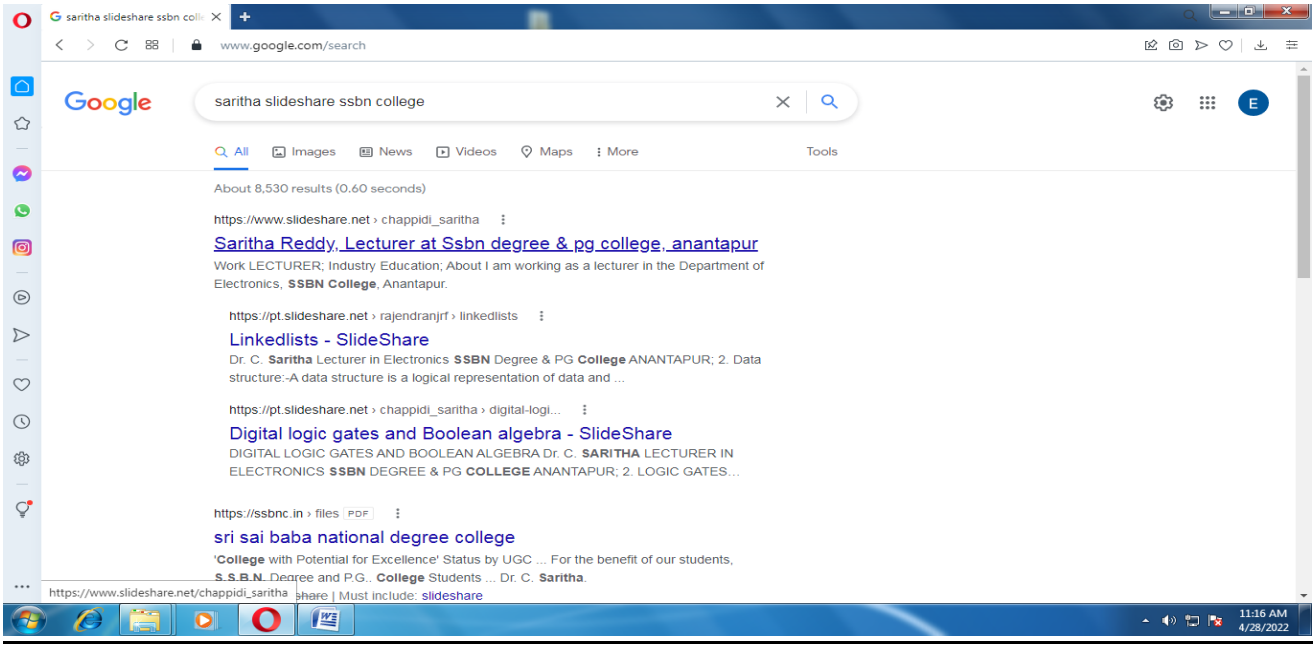
STUDENT PROGRESSION :

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. Likhith	M.IE.Cs. 2021	Infosys	Software Engineer
2	K. Hari	M.IE.Cs. 2021	SKU	MCA
3	K. Anil Babu	M.IE.Cs. 2021	SVU	MBA
4	G. Muttu	M.IE.Cs. 2021	Infosys	Software Engineer
5	J. Badrinath	M.IE.Cs. 2021	TCS	Software Engineer
6	K. Navyavani	M.IE.Cs. 2021	SKU	B.Ed.,

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.IE.Cs

COURSE STRUCTURE FOR M.IE.Cs

B.Sc. FIRST YEAR (M.IE.Cs) ELECTRONICS (CBCS Pattern)							
Semester	**Course**	**Title of the Course**	**Hrs./Week**	**Credits**	**CIA**	**SEA**	**Total**
I	Theory I	Basic Electrical and Electronic Circuits	**4**	**3**	**25**	**75**	**100**
	Practical I	Lab Course I	**2**	**2**	**10**	**40**	**50**
	SDC-I	Electronics in Daily Life	**2**	**2**	**20**	**30**	**50**
II	Theory II	Solid state-Devices & Industrial applications	**4**	**3**	**25**	**75**	**100**
	Practical II	Lab Course II	**2**	**2**	**10**	**40**	**50**
	SDC-II	Fundamentals of Data Communications	**2**	**2**	**20**	**30**	**50**
B.Sc. SECOND YEAR (M.IE.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 and applications	**4**	**4**	**25**	**75**	**100**
	Practical IV	Lab Course IV	**2**	**2**	**10**	**40**	**50**
	Theory-V	Microcontrollers architecture, programming & Industrial applications	**4**	**4**	**25**	**75**	**100**
	Practical-V	Lab Course-V	**2**	**2**	**10**	**40**	**50**

B.Sc. THIRD YEAR (M.IE.Cs) ELECTRONICS (CBCS Pattern)					
Course	**Credits**	**Hrs./week**	**CIA**	**SEA**	**Total**
V Semester					
Paper V : Intel 8085 Microprocessor Architecture & Industrial Applications	4	3	25	75	100
Lab Course V (INTEL 8085 Microprocessor Lab)	**2**	**2**	**15**	**45**	**60**
Paper VI : Electronic Communications and Digital Electronics	4	3	25	75	100
Lab Course VI (Digital & Communications Lab)	**2**	**2**	**15**	**45**	**60**
VI Semester					
Paper VII : Common Paper Microcontroller Architectures & Industrial Applications	4	3	25	75	100
Lab Course VII (General) Microcontrollers Lab.	**2**	**2**	**15**	**45**	**60**
Paper VIII : Cluster papers					
VIII (A) : Embedded System Applications and Real Time 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 VIII (Cluster) Embedded & VLSI	**2**	**2**	**15**	**45**	**60**

CIA: Continuous Internal Assessment SEA: Semester End Assessment

S.S.B.N. DEGREE & PG COLLEGE (AUTONOMOUS) :: ANANTAPUR

DEPARTMENT OF ELECTRONICS

B.Sc. (MIeCs) Industrial Electronics – First Semester Syllabus (Under CBCS)

PAPER I : BASIC ELECTRICAL AND ELECTRONIC CIRCUITS

(w.e.f. 2020-21)

UNIT- I (12 hrs): Passive Components

AC Fundamentals: Generation of alternating voltages, average value, RMS value and form factor. Concepts of impedance, admittance, conductance and susceptance. Power and power factor in ac circuits.

UNIT- II (12 hrs): Three Phase Systems

Three phase systems: Generation of three phase voltages- advantages of three phase systems, star and delta connection. **Transformers:** Construction of single phase and three phase transformers (core type only) –EMF equation, losses and efficiency.

UNIT-III (12 hrs): Network Analysis:

Transient and steady state analysis: AC analysis of RC, RL and RLC circuits, time constant. **Resonance: LCR** Series resonance, bandwidth, Q factor and Selectivity, Parallel resonance circuits.

UNIT-IV (12 hrs): Network Theorems

Energy sources - Voltage and current sources - dependent sources and independent sources - Kirchhoff's Laws- KCL and KVL- Node and mesh analysis – Thevenin's & Norton's theorems. Maximum power transfer theorem.

UNIT-V (12 hrs) : Filter Circuits

Ideal filter circuits - Frequency response of ideal filters, Types of filter circuits – RC - Low pass filter, CR – High pass filter, LR – Low pass filter, RL – High pass filter, RC Differentiating and Integrating Circuits.

References

1. Theraja B. L., A Text Book of Electrical Technology -I, S. Chand & Co, New Delhi, 2013.
2. Bhargava N. N., D C Kulshreshtha and S C Gupta, Basic Electronics & Linear Circuits, TMH, 2013.
3. Kulshreshtha C., Basic Electrical Engineering, Tata McGraw Hill, 2012.

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

DEPARTMENT OF ELECTRONICS

B.Sc. (MIeCs) Industrial Electronics – Second Semester Syllabus (Under CBCS)

PAPER II : ELECTRONIC DEVICES AND INSTRUMENTATION

(w.e.f. 2020-21)

UNIT-I : Semiconductor Devices and BJT

Diodes : P-N junction Diode and Zener diode - Construction, working and V-I characteristics.

BJT : Introduction to BJT, Transistor types – PNP and NPN. Transistor configurations – CB, CE and CC (brief concepts only), Comparison of CB, CE and CC. Construction and Operation of CE Configuration, Characteristics of CE – its parameters. Transistor as an amplifier.

UNIT-II:(16hrs)

FIELD EFFECT TRANSISTORS, UJT & SCR:

FET : Introduction, Construction, Operation and Characteristics of FET**/**JFET, Drain and Transfer characteristics. Depletion type and Enhancement type MOSFETs.

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

Silicon Controlled Rectifier (SCR):

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

UNIT-III: Oscilloscopes & Signal Generators

Introduction to Oscilloscopes: Introduction to Oscilloscopes - Basic Principle, CRT features of Oscilloscope, CRO - Block Diagram, Operation, Vertical Deflection system and Horizontal Deflection System. Measurements with Oscilloscopes (Voltage, Current, Frequency & Phase), Digital Storage Oscilloscopes (DSOs).

Introduction to Signal generators : Standard Signal generators - AF Sine and Square wave generators, Function generator.

UNIT-IV: Power Supplies

Unregulated DC Power supplies- Need of Regulation-DC Voltage regulators-Output current Limiting-Power supply performance and specifications-DC Power supply use-Power supply Testing. Three terminal fixed voltage I.C. regulators (78XX and &79XX) - Principle and working of SMPS (Switch mode power supplies).

UNIT-V: Transducers

Introduction-Electrical transducers-Selecting a transducer, Resistive transducer, Strain gauges, Resistance thermometer, Thermistor, Inductive transducer, Differential output transducers, LVDT, Piezoelectric transducer, Temperature transducers-RTD.

TEXT BOOKS:

1. Electronic Instrumentation, H. S. Kalsi, TMH, 2004
2. Electronic Instrumentation and Measurements, David A Bell, PHI / Pearson

Education, 2006.
3. Electronics & electrical measurements, A K Sawhney, , Dhanpat Rai & sons,
4. Principles of measurement systems, John P. Beately, Pearson Education
5. Modern electronic instrumentation and measuring techniques, Cooper D & A D Helfrick, PHI, 1998.

LIST OF EXPERIMENTS

FIRST SEMESTER

LAB COURSE - 1

1. Basic laws of Resistor, Capacitor, Inductor combinations (Series, Parallel)
2. RC Circuits-Frequency Responce
3. LR Circuits – Frequency Responce
4. LCR Circuit – Q – Factor, Resonance and Bandwidth
5. Verification of Kichoffs Laws
6. Verification of Maximum Power Transfer Theorem
7. Verification of Norton's theorem from the Thevenin's theorem
8. Network Theorems [KVL, KCL, Maximum Power Transfer, Thevenin's and Nortons' theorems]
9. Simulation Lab Experiments

SECOND SEMESTER

LAB COURSE - 2

1. Characteristics of a PN junction diode
2. Characteristics of a Zener diode
3. Zener diode regulation characteristics
4. Familiarization of CRO, Function Generator
5. Measurement of DC, AC voltages, Frequency and Phase
6. Characteristics of BJT
7. Characteristics of FET
8. UJT as a relaxation oscillator
9. Characteristics of Thermistor

S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS) :: ANANTAPUR
DEPARTMENT OF ELECTRONICS
B.Sc. (MIeCs) Industrial Electronics – Third Semester Syllabus (Under CBCS)

PAPER III : Analog circuits and Communications

(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 and non-inverting configurations, concept of virtual ground.

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, Modulations index, 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, Frequency deviation and carrier swing, modulation index, analysis of FM, 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

LAB COURSE -3

Analog circuits and Communications Lab

(Any six experiments should be done)

1. Op-Amp as inverting and non-inverting amplifiers
2. Op-Amp as Voltage follower and current follower.
3. Op-Amp as integrator and differentiator
4. Op-Amp as adder & subtractor
5. Op-Amp as voltage to current converter
6. Op-Amp as square wave generator
7. Study of Amplitude Modulation and Demodulation.
8. Study of Frequency Modulation and Demodulation

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S.S.B.N. DEGREE & P G COLLEGE (AUTONOMOUS):: ANANTAPUR
DEPARTMENT OF ELECTRONICS
B.Sc. (MIeCs) Industrial Electronics – Fourth Semester Syllabus (Under CBCS)
Paper IV : Digital Electronics & Microprocessors architecture -Applications
(w.e.f. 2021-22)

UNIT- I (12 hrs)

NUMBER SYSTEMS : 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)

LOGIC GATES & COMBINATIONAL CIRCUITS : Logic gates (AND,OR,NOT,XOR) Universal logic gates - Boolean algebra, De Morgan's Theorems. Concept of SOP and POS,

K-map method (2 to 4 Variable).

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.

LAB COURSE - 4

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

1. Verification of logic gates.
2. Code conversions (Binary to gray & gray to binary)
3. Construction of Half adder and full adder
4. Construction of Multiplexer (8:1) and De-multiplexer (1:8)
6. Construction of RS and D flip flops
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

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

DEPARTMENT OF ELECTRONICS

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

Paper V: MICROCONTROLLERS AND INDUSTRIAL 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 – editor, 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.
4. The concepts & features of Microcontrollers by Rajkamal - Wheeler Pub

LAB COURSE– 5

Microcontrollers and Industrial Applications 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 (MIeCs): Industrial Electronics –Fifth Semester Syllabus (Under CBCS)
Paper V: INTEL 8085 MICROPROCESSOR ARCHITECTURE & INDUSTRIAL APPLICATIONS
(w.e.f. 2020-21)

UNIT- I (12 hrs)

ARCHITECTURE OF 8085 MICROPROCESSOR:

Introduction to Microprocessors - Evolution of Microprocessors, Intel 8085 Block diagram and its detailed study - Central Processing Unit (CPU) – Arithmetic and Logic Unit (ALU) – Timing and Control Unit – Register Organization – System Bus - address, data and control buses - Pin Configuration of 8085 and its Description. Interrupt Structure.

UNIT - II (12 hrs)

INSTRUCTION SET OF 8085: Instruction set classification - Addressing modes with examples. **Instruction Timing**: Instruction cycle - Machine cycle - T-state - Timing diagrams for Op-code Fetch Cycle. **Memory Operations:** Memory Read, Memory Write, I/O Read and I/O Write operations.

UNIT- III (12 hrs)

PROGRAMMING 8085 : Addition & Subtraction (8-bit and 16-bit), Multiplication, Division, Largest, Smallest, Ascending and Descending of an array (All 8-bit data programming examples). Stack & Subroutine Concepts - Time delay using single and double registers.

UNIT- IV (12 hrs)

MEMORY ORGANIZATION AND INTERFACING : Introduction to Memories, Types of Memories - RAM, ROM, SRAM, DRAM, Flash ROM – Working of SRAM and DRAM Cells. Concept of Memory mapped I/O and I/O mapped I/O techniques, Interfacing of 2K X 8, 4K X 8 ROM, RAM to 8085 microprocessor using Memory Mapped I/O and I/O Mapped I/O techniques. Differences between I/O mapped and Memory Mapped I/O schemes.

UNIT - V (12 hrs)

MICROPROCESSOR BASED INDUSTRIAL APPLICATIONS: Programmable Peripheral Interface (8255) - Pin functions, Different Modes & Block Diagram - Interfacing of 2X16 LCD module - Temperature measurement interfacing LM35 to 8085 processor, DC Motor, Stepper motor and Relay interfacing and control using 8085 microprocessor.

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.Ed 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 Organization and Architecture, Prentice Hall India.
3. Microprocessor lab primer 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. Waveform generation using DAC interface.
6. Stepper motor interface.
7. Interfacing of a DC Motor
8. Temperature measurement using LM35

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

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

B.Sc. (MIeCs) Industrial Electronics –Fifth Semester Syllabus (Under CBCS)

Paper VI : ELECTRONIC COMMUNICATIONS AND DIGITAL ELECTRONICS

(w.e.f 2020-21)

UNIT – I:

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 – II

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.

UNIT - III

Digital Electronics (10)

Number system - Binary number system, Conversion of Binary to Decimal and Vice -Versa, Binary addition and subtraction (1's and 2's compliment methods). Hexa - decimal number system. Converting Binary to Hexa decimal and Vice-versa. Converting Hexa decimal to decimal and Vice-versa. Octal number system – Conversion of Octal to Binary and vice versa. Binary coded decimal (BCD - 8421) and gray code, conversion between Binary and gray code. The ASCII Code (American Standard Code for information interchange).

UNIT – IV (10)

Logic Gates: OR, AND, NOT gates : Truth tables, NAND and NOR gates – their truth tables. Boolean laws. De-morgan's theorems and their verification.

Logic families : RTL, DTL, TTL and CMOS logics.

UNIT – V (10)

Combinational and Sequential Logic Circuits

Combinational Logic circuits: Half adder, Full adder and parallel binary adders, Multiplexer (4:1) and demulatiplexer (1:4).

Sequential logic circuits: Flip – Flips: RS, T, D and J-K their working and Truth tables. Shift registers – Shift left and Shift right.

TEXT BOOKS:

1. Microelectronics: Jacob Millman & Arvin Grabel,. 2 nd Ed., TMH, 1999
2. Electronic Communications: Kennedy, TMH
3. Principles of Digital Electronics: Malvino & Leach., TMH
4. Digital Electronics – V.K. Puri , TMH

REFERENCE BOOKS:

1. Modern Electronics Communications: Gray and Miller
2. Digital Electronics: William H. Gothman
3. Modern Digital Electronics – R.P. Jain, TMH
4. Digital Electronics Fundamentals J. Floyd
5. Digital Design – Morris Mano

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. 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. (MIeCs) Industrial Electronics – Sixth Semester Syllabus (Under CBCS)

Paper VII: MICROCONTROLLER ARCHITECTURES & INDUSTRIAL 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, Editor, Compiler, Emulator, Simulator & Debugger.

UNIT-II : INTEL 8051Microcontroller 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 : Programming of 8051 Microcontroller

Addressing modes and accessing memory using various addressing modes. Instruction set classification: 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: Microcontroller based Industrial Applications

Interfacing of - PPI 8255 - Interfacing of 2x16 LCD Module and displaying data - Control and Interfacing of Stepper Motor & DC Motors - Interfacing a Relay module – Interfacing of Temperature sensor LM 35 and temperature measurement.

UNIT – V: Introduction to PIC Microcontrollers

Overview of PIC 16CXX family microcontrollers, 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 Microcontroller Based Embedded Systems By Manish .K.Patel, TMH
3. The 8051 Microcontrollers and Embedded Systems – By Muhammad Ali Mazidi and Janice Gillispie Mazidi- Pearson Education Asia, 4th Reprint, 2002.

4. Microcontrollers – Theory and applications by Ajay V. Deshmukh-TMH
5. PIC Microcontroller and Embedded Systems using Assembly and C for PIC- Muhammad Ali Mazidi-Pearson Edition.
6. 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. (MIeCs) Industrial 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
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Paper VIII (B) : VLSI DESIGN
(w.e.f. 2020-21)

UNIT-I .Introduction to VLSI Design

VLSI Technology Fundamentals, Applications, Overview. 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 (using VHDL and Verilog) of logic gates like NAND, NOR, X-OR.

Combinational Circuits - Half adder, Full adder, Comparator, Multiplexer.

Sequential logic circuits - J-K & D Flip-flops.

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
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B.Sc. (MIeCs) Industrial 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 Industrial Electronics 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