## DEPARTMENT OF ELECTRONICS

The Department of Electronics was started in the year 2016 with an UG Courses B.Sc (Maths, Electronics , and Computer Science) was introduced.

The department is having well qualified and experienced faculty members. The faculty is a perfect blend of different specializations in Electronics and applications to impart their expertise in handling diversified courses of the UG programs. The teaching methodology in the department goes beyond fulfilling the syllabus requirements of the University, to meet the today's industry needs. Faculty motivates and guides the students to do mini projects in core subjects. Special focus will be given to develop Communication and Soft Skills. The Department adopted and made the ICT in teaching techniques effectively.

**Vision**

The Department endeavors to facilitate state of the art technical education in the field of Electronics and Communication Engineering by infusing scientific temper in the students leading towards research and to grow as centre of excellence in the field.

The vision of the department is to provide education to students that is directly applicable to problems and situations encountered in real life and thus foster a successful career. The department aims to provide the best platform to students and staff for their growth.

***Mission***

The Mission of the Department of Electronics is:

1. To be the epitome of academic rigour, flexible to accommodate every student and faculty for basic, current and future technologies in Electronics and Communication Engineering.
2. Strengthening and providing support in sustaining a healthy society by improving the quality of life through the application of technology.

**Course Structure under CBCS:**

# SRI KRISHNADEVARAYA UNIVERSITY

## ANANTAPURAMU

THREE YEARS B.Sc - ELECTRONICS COURSE STRUCTURE - SEMESTER WISE UNDER CBCS

| SEMESTER | PAPER | YEAR / TITTLE OF THE PAPERS | CREDITS | MARKS | | TOTAL MARKS |
|---|---|---|---|---|---|---|
| | | | | IA | ES | |
| | | **FIRST YEAR ( w.e.f 2015 – 2016 )** | | | | |
| I | 1 | BASIC CIRCUIT THEORY | 4 | 25 | 75 | 100 |
| | | LAB-1 : ELECTRONICS | 2 | | 50 | 50 |
| II | 2 | ELECTRONICS DEVICES AND CIRCUITS | 4 | 25 | 75 | 100 |
| | | LAB-2 : ELECTRONICS | 2 | | 50 | 50 |
| | | **SECOND YEAR ( w.e.f 2016 - 2017 )** | | | | |
| III | 3 | DIGITAL ELECTRONICS | 4 | 25 | 75 | 100 |
| | | LAB-3 : DIGITAL ELECTRONICS | 2 | | 50 | 50 |
| IV | 4 | ANALOG & DIGITAL I C APPLICATIONS | 4 | 25 | 75 | 100 |
| | | LAB-4 : ANALOG & DIGITAL I C 'S | 2 | | 50 | 50 |
| | | **THIRD YEAR ( w.e.f 2017 - 2018 )** | | | | |
| V | 5 | MICRO PROCESSOR – 8085 & APPLICATIONS | 4 | 25 | 75 | 100 |
| | | LAB-5 : MICRO PROCESSOR – 8085 | 2 | | 50 | 50 |
| | | OPTIONAL ELECTIVE PAPERS ( CHOOSE ANY ONE ) | | | | |
| | 6 ( A ) | ELECTRONIC COMMUNICATIONS | 4 | 25 | 75 | 100 |
| | | LAB-6 (A) : ELECTRONIC COMMUNICATIONS | 2 | | 50 | 50 |
| | 6 ( B ) | CONSUMER ELECTRONICS | --------- do ---------- | | | |
| | | LAB-6 (B) : CONSUMER ELECTRONICS | | | | |
| VI | 7 | CLUSTER ELECTIVES -I ( CHOOSE ANY ONE CLUSTER ) | | | | |
| | | CLUSTER – A : | | | | |
| | | MICRO CONTROLLER – 8051 & APPLICATIONS | 4 | 25 | 75 | 100 |
| | | Lab - 7 : MICRO CONTROLLER – 8051 | 2 | | 50 | 50 |
| | | CLUSTER – B : | | | | |
| | | OPTICAL FIBER COMMUNICATION | ----- do ----- | | | |
| | | Lab - 7 : OPTICAL FIBER COMMUNICATION | | | | |
| | | CLUSTER – C : | | | | |
| | | MATHEMATICAL METHODS AND ANALYSIS USING MATLAB | ------ do ----- | | | |
| | | Lab - 7 : MATLAB | | | | |
| | | CLUSTER ELECTIVES –II ( SELECT ONLY CONCERNED CLUSTER ) | | | | |
| | 8 | CLUSTER – A | | | | |
| | | A-1 : VLSI DESIGN | 4 | 25 | 75 | 100 |
| | | A-2 : DATA COMMUNICATION AND NETWORKING | 4 | 25 | 75 | 100 |
| | | A-3 : PROJECT WORK | 4 | 25 | 75 | 100 |
| | | Lab - 8 : VHDL / Verilog HDL | 2 | | 50 | 50 |
| | | Lab - 9 : DATA COMMUNICATION AND NETWORKING | 2 | | 50 | 50 |
| | | CLUSTER – B | | | | |
| | | B-1 : SATELLITE COMMUNICATIONS | ----- do --------- | | | |
| | | B-2 : WIRELESS COMMUNICATIONS | | | | |
| | | B-3 : PROJECT WORK | | | | |
| | | Lab - 8 : SATELLITE COMMUNICATIONS | | | | |
| | | Lab - 9 : WIRELESS COMMUNICATIONS | | | | |
| | | CLUSTER – C | | | | |
| | | C-1 : DIGITAL SIGNAL PROCESSING | ------ do ------ | | | |
| | | C-2 : CONTROL SYSTEMS | | | | |
| | | C-3 : PROJECT WORK | | | | |
| | | Lab - 8 : DIGITAL SIGNAL PROCESSING | | | | |
| | | Lab - 9 : CONTROL SYSTEMS | | | | |
| IMPORTANT NOTICE : **In case selecting CLUSTER-A in PAPER-7 ( SEMESTER-VI ) From CLUSTER ELECTIVES –I then Compulsory Should Take CLUSTER-A Only in PAPER-8 From CLUSTER ELECTIVES –II . The Same method is Proceed in The Subsequent CLUSTERS for Choosing Clusters .** | | | | | | |
| | | TOTAL | 58 | 250 | 1200 | 1450 |

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# THIRD YEAR B.Sc - ELECTRONICS – SYLLABUS :: SEMESTER - VI

## PAPER - 7 : CLUSTER-A

## PAPER - 7 (A) : MICRO CONTROLLER - 8051 & APPLICATIONS

( w. e .f 2017-18 )

**Work load: 60 hrs** **4 hrs/week**

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

Architecture and Pin Discription of 8051 - Memory organization - Port Organizations - Interrupts - Timers and Counters.

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

Classification of Instruction set of 8051 - Data transfer , Arithmatic , Logical , Single Bit , rotate , Compare , jump , Loop and Call instructions - Addressing Modes.

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

Programs : Addition , Subtraction , Multiplication ( repeated addition method ) , Division ( repeated subtraction method ) , Smallest , Largest , Ascending and Descending orders ( all 8-bits only ).

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

Interfacing of 8255 with 8051 - Interfacing of 7 Segment LED Display with 8051 - Interfacing of Matrix ( 4 x 4 ) Key Board - Interfacing of L C D with 8051 - Interfacing of Temparature Measurement

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

Interfacing of Binary Counter - Interfacing of Stepper Motor - Interfacing of A D C - Interfacing of DAC ( Square wave generation only ) - Serial Communications ( RS-232 ) .

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**TEXTBOOKS**

1. Kenneth 1. Ayala, "The 8051 Microcontroller, Architecture, Program and Application" Pen ram International.
2. Muhammed Ali Mazidi, Janice GillispieMazidi "The 8051 Microcontroller and Embedded Systems" -Low Price Edition.
3. Microprocessors & Microcontrollers by N. Senthilkumar, M. Saravanan& S. Jeevananthan, 1st edition. Oxford press (Helpful for interfacing applications)
4. Micro corurollers: Theo & App by Ajay V. Deshmuk Tata McGraw-Hill Education

## ELECTRONICS : LAB - 7 (A)

## ( MICRO - CONTROLLER 8051 - LAB)

**Work load: 30 hrs per semester** **2 hrs/week**

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

1. Multiplication & Division of Two 8-Bit Numbers by using kit only .
2. Largest & Smallest Number of two 8-bit numbers by using kit only.
3. Ascending & Descending order by using kit only
4. Interfacing - Stepper motor to rotate Clockwise or Anti Clock wise
5. Interfacing - LCD to Display Characters and Numbers .
6. Interfacing - DAC ( Square Wave Generation )
7. Interfacing - Binary Counter ( Count From : 00 H to FF H )

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THIRD YEAR B.Sc - ELECTRONICS – SYLLABUS : SEMESTER : VI

PAPER-8 : **CLUSTER-A**

**A1 : VLSI DESIGN**

**( w. e .f 2017-18 )**

**Work load: 60 hrs** **4 hrs/week**

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

Defination , Classification's , Advantages of IC's - MOS : Enhancement Modes of NMOS , PMOS - CMOS Fabrications : n-Well , p-Well

**UNIT- II (12 hrs)**

NMOS Inverter - CMOS Inverter – VLSI Design Flow : Design Specification's , Design Entry – Examples of ( Circuit Diagrams only ) NMOS , PMOS and CMOS .

**UNIT- III ( 12 hrs )**

Basic logic gates in CMOS – Complex logic gate : Two , Three inputs of CMOS NAND gate - Combinational Logic : Two and Three inputs of CMOS NOR gate - Compound gates in CMOS .

**UNIT- IV (10 hrs)**

**VHDL :** Brief History , Logical , Relational , Arithmatic , Shift and Rotate Operators , Data Types .

**Verilog HDL :** Brief History , Logical , Relational , Arithmatic , Shift and Rotate Operators , Data Types . Comparison of VHDL and Verilog HDL .

**UNIT- V (l4 hrs)**

Data - Flow Description's and HDL Programs :-

Basic Logic Gates , Universal Gates , Half-Adder , Multiplexer , Magnitude Comparator , Binary Adder .

TEXT BOOKS :

1. VLSI Design By Vilas S. Bagad
2. VHDL and Verilog Programming By Nazeih M.Botros
3. VLSI Design By A.Albert Raj and T.Latha

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# ELECTRONICS : LAB - 8

## VHDL / Verilog HDL LAB

**Work load: 30 hrs per semester** **2 hrs/week**

ANY SIX EXPERIMENTS SHOULD BE ONE

1) BASIC GATES CIRCUIT
2) UNIVERSAL GATES
3) HALF –ADDER
4) FULL -ADDER
5) MULTIPLEXER
6) DECODER
7) S-R LATCH
8) D-LATCH
9) MAGNITUDE COMPARATOR
10) BINARY ADDER

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THIRD YEAR B.Sc- ELECTRONICS – SYLLABUS :: SEMESTER: VI

PAPER - 8 : CLUSTER-A

A2 : DATA COMMUNICATION AND NETWORKING

( w. e .f 2017-18)

Work load: 60 hrs 4 hrs/week

**Unit- 1 (12 Hrs) :**

Data Communication and its Components - Introduction of Network , Types of Networks : Personal Area Network , Local Area Network , Metropolitan Area Network , Wide Area Network .

**Unit- 2 (14 Hrs) :**

Network Topologies : Bus Topology , Star Topology , Ring Topology , Mesh Topology , Tree Topology , Hybrid Topology .

**Unit- 3 (10 Hrs) :**

Transmission Media's - Guided Media : Twisted Pair Cable , Coaxial Cable , Optical Fiber Cable . Un- Guide Media : Radio Waves , Micro Waves , Infrared .

**Unit-4 ( 10 Hrs) :**

Data Transmissions : Digital - To - Digital Conversion ( Line Coding only ) , Analog - To - Digital Conversion ( PCM only ) , Digital - To - Analog Conversion ( ASK only ) , Analog - To - Analog Transmission ( AM only ) - Transmission Modes ( Parallel and Serial )

**Unit- 5 (14 Hrs) :**

Frequency Division Multiplexing , Time Division Multiplexing , Wave Division Multiplexing . Modems : Traditional Modems , Cable Modems .

**Text Books:**

1. Data Communication and Networking ( 2 Edition ) By Behrouz A.Forouzan
2. Data and Computer Communication By Stallings William
3. Computer Networks By Kurose James F

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## ELECTRONICS : LAB - 9

### DATA COMMUNICATION AND NETWORKING

**Work load : 30 hrs per semester** **2 hrs/week**

**ANY SIX EXPERIMENTS SHOULD BE DONE**

1. TO STUDY DIFFERENT TYPES OF TRANSMISSION MEDIA
2. TO STUDY THE SERIAL INTERFACE USING RS-232
3. TO STUDY LAN USING STAR TOPOLOGY
4. TO STUDY LAN USING BUS TOPOLOGY
5. TO STUDY LAN USING TREE TOPOLOGY
6. TO STUDY CONFIGURE MODEM OF COMPUTER
7. TO STUDY CONFIGURE HUB / SWITCH

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THIRD YEAR B.Sc - ELECTRONICS : SEMESTER – VI

PAPER-8 : CLUSTER - A / B / C

## A3 / B3 / C3 : PROJECT WORK

**Work load : 60 hrs ( 4 Hours/week )** **Max.Marks : 75**

The objective of the Project is to motivate them to work in emerging / latest technologies, help the students to develop ability , to apply theorical and Practical tools / techniques to solve real life problems related to industry , academic institutions and research laboratories. **the Project is of 4 hours / week for VI Semester : PAPER - 8 ( A3 / B3 / C3 )** duration and a students is expected to do Planning , Analysing , Coding, and Implementing the project . the initiation of project should be with the project proposal . the synopsis approval will be given by the project guides ( Subject Lecturer only ).

The Project Proposal should include the following :-

- Tittle , Objectives , Apparatus , Circuit Diagrams , Model Graphs , Tabular Colums
- Input , Observations , Process logic , Programming , Output , Flow chats , Algorithm
- Advantages and Dis-advantages , Application's .....etc

The Project work should be an only **ONE MEMBER** . the students shall submit a project report and defined their dissertation infront of Examiner . The Scheme of Evaluation of Project Work is given below.

**MARKS DISTRIBUTION IN PROJECT WORK**

**Subject : ELECTRONICS : PAPER - 8 ( A3 / B3 / C3 ) )** **Max. Marks : 75**

| S.No | PROJECT WORK DETAILS | ALLOTED MARKS | | | PASS MARKS ( 40 % ) |
|---|---|---|---|---|---|
| 1 | DESSERTATION | 10 | RECORD MARKS | 10 | 30 |
| 2 | PRESENTATION | 30 | EXPERIMENT MARKS | 65 | |
| 3 | COMPREHENSIVE – VIVA VOCE | 35 | | | |
| | TOTAL | 75 | | | 30 |

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# B. Sc ELECTRONICS SYLLABUS UNDER CBCS

( Common Syllabus for all Universities in Andhra Pradesh State )

w.e.f. 2020-21 ( revised in June 2020 )

| YEAR | SEMESTER | Paper | Tittle of the Paper | IA | EA | Total |
|---|---|---|---|---|---|---|
| I Year | I | I | CIRCUIT THEORY AND ELECTRONIC DEVICES | 25 | 75 | 100 |
| | | | PRACTICALS | | 50 | 50 |
| | II | II | DIGITAL ELECTRONICS | 25 | 75 | 100 |
| | | | PRACTICALS | | 50 | 50 |
| II Year | III | III | ANALOG CIRCUITS AND COMMUNICATION | 25 | 75 | 100 |
| | | | PRACTICALS | | 50 | 50 |
| | IV | IV | MICROPROCESSOR SYSTEMS | 25 | 75 | 100 |
| | | | PRACTICALS | | 50 | 50 |
| | | V | MICRO CONTROLLER AND INTERFACING | 25 | 75 | 100 |
| | | | PRACTICALS | | 50 | 50 |

**Note :**

In each semester the Practical examinations shall be conduct deffinately done Externally by an **EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY** w.e.f 2020-2021 which will enhance the quality of evaluation & improved Practical Education . Do not Conduct the Practical Examinations internally in any semester by Concerned College under any circumstances , the method is Purely unfaithful .

Syllabus approved

M. Basaveswara 19/10/20

Chairperson

(From: Balayesu Degree College: Hindupur)

Board of Studies in Electronics in B.Sc

S.K.University :: Anantapuramu

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2020-21 (revised in June 2020)

**SEMESTER-1** **PAPER – I**

## CIRCUIT THEORY AND ELECTRONIC DEVICES

### Objectives:

- To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques.
- To analyze circuits in time and frequency domain.
- To synthesize the networks using passive elements.
- To understand the construction, working and VI characteristics of electronic devices.
- To understand the concept of power supply.

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

**SINUSOIDAL ALTERNATING WAVEFORMS:**

Definition of current and voltage. The sine wave, general format of sine wave for voltage or current , phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C . Phase relation of R, L and C

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

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

Branch current method, Nodal Analysis, star to delta & delta to star conversions. Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems.

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

**RC, RL AND RLC CIRCUITS:**

Frequency response of RC and RL circuits, their action as low pass and high pass filters. Passive differentiating and integrating circuits. Series resonance and parallel resonance circuits, Q – Factor.

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

**BJT, FET and UJT:**

BJT: Construction, working, and characteristics of CE Configurations. Hybrid parameters and hybrid equivalent circuit of CE Transistor,

FET : Construction, working and characteristics of JFET and MOSFET.

Advantages of FET over BJT.

UJT: Construction , working and characteristics of UJT. UJT as a Relaxation oscillator.

Syllabus approved

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Chairperson 19/10/20
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**UNIT-V : (12hrs)**

**POWER SUPPLIES & PHOTO ELECTRIC DEVICES :**

Rectifiers: Half wave, full wave rectifiers - Efficiency- ripple factor- Filters- L-section & π-section filters. Three terminal fixed voltage I.C. regulators (78XX and &79XX). Light Emitting Diode – Photo diode and LDR .

**TEXT BOOKS:**

1. Introductory circuit Analysis (UBS Publications) ---- **Robert L. Boylestad.**
2. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louisashelsky.**
3. Circuit Analysis by **P.Gnanasivam- Pearson Education**
4. Electronic Devices and Circuit Theory --- **Robert L. Boylestad & Louis Nashelsky.**
5. Electronic Devices and Circuits I – **T.L.Floyd- PHI Fifth Edition**

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

## Outcomes:-

- ✓ Apply concepts of electric network topology, nodes, branches, loops to solve circuit problems including the use of computer simulation.
- ✓ Apply time and frequency concepts of analysis.
- ✓ Synthesize the network using passive elements.
- ✓ Know about amplifier circuits, switching circuits and oscillator circuits their design and use in electronics.
- ✓ Design and construction of a power supply.

Syllabus approved

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## ELECTRONICS LAB-I

### ( Circuit Theory and Electronic Devices )

**LAB LIST:**

1. Thevenin's Theorem-verification
2. Norton's Theorem-verification
3. Maximum Power Transfer Theorem-verification
4. LCR series resonance circuit.
5. BJT input and output characteristics
6. FET Output and transfer characteristics
7. UJT VI characteristics
8. LDR characteristics
9. IC regulated power supply(IC-7805)

**Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.**

**Note :**

the Practical examinations shall be deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021 .

Syllabus appsoved

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w.e.f. 2020-21 (revised in June 2020)

**SEMESTER – II** **PAPER – 2**

# Digital Electronics

## Objectives:

- To understand the number systems, Binary codes and Complements.
- To understand the Boolean algebra and simplification of Boolean expressions.
- To analyze logic processes and implement logical operations using combinational logic circuits.
- To understand the concepts of sequential circuits and to analyze sequential systems in terms of state machines.
- To understands characteristics of memory and their classification.
- To implement combinational and sequential circuits using VHDL.

**UNIT – I : (12hrs)**
**NUMBER SYSTEM AND CODES :**

Decimal, Binary, Hexadecimal, Octal. Codes: BCD, Gray and Excess-3 codes- code conversions - Complements (1's, 2's,9's and 10's), Addition - Subtraction using complement methods.

**UNIT- II : (12hrs)**
**BOOLEAN ALGEBRA AND THEOREMS :**

Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS) , Minimization Techniques (Karnaugh Map Method: 2,3 variables) .

**UNIT-III : (12hrs)**
**COMBINATIONAL DIGITAL CIRCUITS** :

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (4:1)) and Demultiplexers (1:4), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, CMOS Logic families (NAND&NOR Gates).

**UNIT-IV : (12hrs)**
**SEQUENTIAL DIGITAL CIRCUITS** :

Flip Flops : S-R FF , J-K FF, T and D type FFs , Master-Slave FFs , Excitation tables ,
Registers : Serial In Serial Out and Parallel In and Parallel Out ,
Counters : Asynchronous - Mod-8 , Mod-10 , Synchronous - 4-bit & Ring counter.

Syllabus approved
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**UNIT-V : (12hrs)**
**MEMORY DEVICES :**

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM,

**TEXT BOOKS:**


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. G.K.Kharate-Digital electronics-oxford university press
4. S.Salivahana & S. Arivazhagan-Digital circuits and design
5. Fundamentals of Digital Circuits by Anand Kumar


**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. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters : Fundamentals & Applications". TMH. 1994.
4. *Malvino and Leach. " Digital Principles and Applications". TMG Hill Edition.*


## Outcomes:-

- ✓ Develop a digital logic and apply it to solve real life problems.
- ✓ Analyze, design and implement combinational logic circuits.
- ✓ Classify different semiconductor memories.
- ✓ Analyze, design and implement sequential logic circuits.
- ✓ Simulate and implement combinational and sequential logic circuits using VHDL

Syllabus approved

M. Baraveerayya 19/10/20

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## ELECTRONICS LAB - 2

## ( DIGITAL ELECTRONICS LAB )

**LAB LIST:**

1. Verification of IC-logic gates
2. Realization of basic gates using discrete components (resistor, diodes & transistor)
3. Realization of basic gates using Universal gates (NAND & NOR gates)
4. Verify Half adder and full adder using gates
5. Verify Half subtractor and full subtractor using gates.
6. Verify the truth table Multiplexer and demultiplexer.
7. Verify the truth table Encoder and ecoder.
8. Verify the truth table of RS , JK, T-F/F using NAND gates
9. 4-bit binary parallel adder and subtractor using IC 7483
10. BCD to Seven Segment Decoder using IC -7447 / 7448

**Lab experiments are to be done on breadboard and simulation software (using multisim) and output values are to be compared and justified for variation.**

**Note :**

the Practical examinations shall be deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021 .

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Syllabus approved

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Chairperson

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B.Sc. Electronics Syllabus under CBCS

w.e.f. 2021-22 (revised in June 2020)

**2nd YEAR**

**SEMESTER – III** **PAPER – 3**

## ANALOG CIRCUITS AND COMMUNICATION

**OBJECTIVES:**

- To understand the concepts, working principles and key applications of linear integrated circuits.
- To perform analysis of circuits based on linear integrated circuits.
- To design circuits and systems for particular applications using linear integrated circuits.
- To introduce students to various modulation and demodulation techniques of analog communication.
- To analyse different parameters of analog communication techniques.
- It also focuses on Transmitters and Receivers.

**UNIT – I : (12hrs)**

**OPERATIONAL AMPLIFIERS:**

Definition , Characteristics of Op-Amp, Block diagram of op-amp, inverting, noninverting, virtual ground, , summing amplifier, subtractor, voltage follower, op-amp parameters, voltage to current convertor ,integrator, differentiator, differential amplifier, Logarithmic amplifier.

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

**OP-AMP CIRCUITS :**

voltage regulator, comparator, zero cross detecting circuit, instrumentation amplifier, Schmitt trigger. sine wave generator, square wave generator, triangular wave generator, Active filters (Basics)-low pass, high pass, band pass filters

IC-555 –functional block diagram and mention it's applications

**UNIT –III : (12Hrs)**

**AMPLITUDE MODULATION:**

Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave . Generation of AM- Transistor modulators . Detection of AM signals – Diode detector.

Syllabus approved

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## UNIT-IV : (12hrs)

### FREQUENCY MODULATION :

Theory of FM , Frequency deviation and carrier swing, modulation index, deviation ratio, percent modulation . Mathematical representation of FM, frequency spectrum and bandwidth of FM waves, Generation of FM signals – Varactor diode modulator and Reactance modulator. Detection of FM waves – FM demodulation with discriminator.

## UNIT-V : (12hrs)

### RADIO BROADCASTING AND RECEPTION :

Spectrum of electromagnetic waves , Radio broadcasting and reception, Transmitter, AM receivers - Straight forward receiver, Super heterodyne receiver . FM receivers.

### TEXT BOOKS:

1. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
2. Linear Integrated Circuits By Roy Choudary
3. Unified Electronics Vol II – J.P. Agarwal and Amit Agarwal.
4. Electronic Communications - George Kennedy
5. Antennas and Wave Propagation – G.S.N.Raju – PHI
6. Principles of communication system –Herbert Taub & D.L.Schilling

### Reference Books :

1. Jacob Millan ,Micro Electronics,McGraw Hill.
2. Mithal G K, Electronic Devices and Circuits Thana Publishers.
3. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall
4. Electronic Communications – Roody & Colen
5. Communication Systems – Hayken --- 4th Edition
6. Modern digital and analog communication system –B.P. Lathi

### OUTCOMES:

- ✓ Understand the fundamentals and areas of applications for the integrated circuits.
- ✓ Analyze important types of integrated circuits.
- ✓ Demonstrate the ability to design practical circuits that perform the desired operation.
- ✓ Select the appropriate integrated circuit modules to build a given application.
- ✓ Use of different modulation and demodulation techniques used in analog communication.
- ✓ Identify and solve basic communication problems.
- ✓ Analyze transmitters and receiver circuits.

Syllabus approved

M. Basaveshwar 19/10/20

Chairperson

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# Electronics Lab - 3

## ( Analog Circuits and Communication)

**LAB LIST:**

1. Op-Amp as inverting and non-inverting
2. OpAmp 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. Amplitude modulation and demodulation.
8. AM Transimitter and Receiver.
9. FM Transmitter and Receiver.

**Note :**

the Practical examinations shall be deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021 .

Syllabus appsoved

M. Basaveshwara 19/10/20

Chairperson

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B.Sc. Electronics Syllabus under CBCS

w.e.f. 2021-22 (revised in June 2020)

2nd YEAR

**Semester-IV** **Paper-IV**

## MICROPROCESSOR SYSTEMS

**OBJECTIVES:**

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of Microprocessors
- To understand RISC based microprocessors.
- To understand concept of multi core processors.

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

**CPU ARCHITECTURE :**

Introduction to Microprocessor, INTEL -8085 ($_P$) Architecture, CPU , ALU unit, Register Organisation , Address, data and control Buses . Pin configuration of 8085 , Addressing modes

8086 Microprocessor : Architecture, Pin description . Instruction format, Instruction Execution timing , Addressing modes

**UNIT -II: (12 )**

8085 INSTRUCTION SET :

Data transfer Instruction , Logical Instructions, Arithmetic Instructions, Branch Instructions, Machine Control instructions .

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

Assembly Language Programming using 8085, Programmes for Addition, Sutraction, Multiplication, Division, largest and smallest number in an array. BCD to ASCII and ASCII to BCD.

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D. Basavaraju 19/10/20

Chairperson

(From: Balayesu Degree College: Hindupur)

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

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces : Serial Communication interfaces, Parallel Communication , Programmable Timers , Keyboard and display, DMA controller

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

**ARM PROCESSOR :** Introduction to 16/32 bit processors, Arm architecture & organization , Arm based MCUs , Programming model , Instruction set.

**TEXT BOOKS:**

1. Microprocessor Architecture, Programming and Applications with the 8085 – Penram International Publishing, Mumbai.- Ramesh S. Gaonakar
2. Microcomputer Systems the 8086/8088 family – YU-Cheng Liu and Glenn SA Gibson
3. Microcontrollers Architecture Programming, Interfacing and System Design

   – **Raj Kamal Chapter: 15.1, 15.2, 15.3, 15.4.1**
4. 8086 and 8088 Microprocessor by Tribel and Avatar Singh

**REFERENCES:**

1. Microprocessors and Interfacing – Douglas V. Hall
2. Microprocessor and Digital Systems – Douglas V. Hall
3. Advanced Microprocessors & Microcontrollers - B.P.Singh & Renu Singh – New Age
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Arm ltd.

**OUTCOMES:**

- The student can gain good knowledge on microprocessor and implement in practical applications
- Design system using memory chips and peripheral chips for 16 bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
- Understand multi core processor and its advantages

Syllabus approved

M. Baraveshi 19/10/20

Chairperson

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# ELECTRONICS LAB-IV

## MICROPROCESSOR SYSTEMS

LAB LIST:

Programs using Intel 8085 /8086

1. Addition and Subtraction (8 bit and 16-bit)
2. Multiplication and Division (8-bit)
3. Largest number in an array.
4. Smallest number in an array.
5. BCD to ASCII and ASCII to BCD .
6. Program To Convert Two Bcd Numbers In To Hex
7. Program To Convert Hex Number In To Bcd Number.
8. Program To Find The Square Root Of A Given Number.
9. Interfacing Experiments Using 8086 Microprocessor (Demo):
   1. Traffic Light Controller
   2. Elevator,
   3. 7-Segment Display

**Note :**

the Practical examinations shall be deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021 .

Syllabus approved

M. Basaveshwar 19/10/20

Chairperson

(From: Balayesu Degree College: Hindupur)
Board of Studies in Electronics in B.Sc
S.K.University :: Anantapuramu

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2021-22 (revised in June 2020)
**2nd YEAR**

**IV SEMESTER** **Paper: V**

## MICROCONTROLLER AND INTERFACING

**OBJECTIVES:**

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

**UNIT-I** : (10Hrs)

Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit , Development tools for micro controllers, Assembler-Compiler-Simulator / Debugger.

**UNIT –II** : (10Hrs)

### Microcontroller Architecture:

Overview and block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Port organization, Interrupts and timers.

**UNIT-III** : (10Hrs)

### Addressing modes, instruction set of 8051:

Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Time delay generation and calculation, Timer/Counter Programming.

**UNIT –IV :** (15Hrs)

Assemble language programming Examples : Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest / smallest order.

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**UNIT-V** : (15Hrs)

## Interfacing and Application of Microcontroller:

Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays , displaying information on a LCD , control of a stepper Motor (Uni-Polar) .

**TEXT BOOKS:**

1. The 8051 microcontroller and embedded systems using assembly and c-kennet j. Ayalam, 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.

**REFERENCE BOOKS:**

1. Microcontrollers Architecture Programming, Interfacing and System Design – **Raj Kamal.**
2. The 8051 Microcontroller Architecture, Programming and Application - **Kenneth J. Ajala** , west publishing company (ST PAUL, NEW YORK, LOS ANGELES, SAN FRANCISCO).
3. Microcontroller theory and application-Ajay V. Deshmukh

**OUTCOMES:**

- The student can gain good knowledge on microcontrollers and implement in practical applications
- learn Interfacing of Microcontroller
- get familiar with real time operating system

Syllabus approved

M. Basaveshwarappa 19/10/20
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# ELECTRONICS LAB-V

## MICROCONTROLLER LAB

**LAB LIST:**

1. Addition And Subtraction Of Two 8-Bit Numbers.
2. Multiplication And Division Of Two 8-Bit Numbers.
3. Largest number /smallest in an array.
4. Exchange Of Higher And Lower Nibbles In Accumulator.
5. Addition Of Two 8-Bit Numbers (Keil Software).
6. Addition Of Two 16-Bt Numbers (Keil Software)
7. Subtraction Of Two 8-Bit Numbers (Keil Software).
8. Subtraction Of Two 16-Bit Numbers (Keil Software).
9. Multiplication Of Two 8-Bit Numbers (Keil Software).
11. Program For Swapping And Compliment Of 8-Bit Numbers (Keil Software).
12. Program To Find The Largest Number In Given Array (Keil Software).
13. Program To Find The Smallest Number In Given Array (Keil Software).
14. Interfacing Led To 8051 Microcontroller (Keil Software).
15. Interfacing Buzzer To 8051 Microcontroller (Keil Software).
16. Interfacing Relay To 8051 Microcontroller (Keil Software).
17. Interfacing Seven Segments To 8051 Microcontroller (Keil Software).

**Note :**

the Practical examinations shall be deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021.

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## IMPORTANT INSTRUCTIONS TO DEAN / DIRECTOR OF EXAMINATION'S & EVALUATION 'S OF ALL UNIVERSITIES ON THEORY AND PRACTICALS OF EXAMINATIONS :

1. The duration of the examination for each theory examinations is 3 hrs.

   The duration of each practical examination is 2 hrs with 50 marks

2. Each course in theory is of 100 marks and practical course is of 50 marks.
   - Semester End University Examination in Theory

     Course: 75 marks [ External evaluation]

   - Semester End University Examination in Practical

     50 marks [ External evaluation]

3. In each semester the Practical examinations shall be conduct deffinately done by an EXTERNAL PRACTICAL EXAMINER APPOINTED BY THE UNIVERSITY w.e.f 2020-2021 which will enhance the quality of evaluation & Practical Education. Do not Conduct the Practical Examinations internally in any semester by Concerned College under any circumstances , the method is Purely unfaithful.

Syllabus approved

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Chairperson

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# B.Sc. ELECTRONICS

w.e.f. 2020-21 ( Revised in June 2020)

**MODEL QUESTION PAPER COMMON FOR ALL FIVE THEORY PAPERS**

Time : 3 hrs Max marks : 75

## SECTION-A

**Essay Type Questions** *Marks* : 5x10M = 50M

Answer All questions with internal choice from each Unit

1. a) Essay type question from Unit-1

   Or

   b) Essay type question from Unit-1

2. a) Essay type question from Unit-2

   Or

   b) Essay type question from Unit-2

3. a) Essay type question from Unit-3

   Or

   b) Essay type question from Unit-3

4. a) Essay type question from Unit-4

   Or

   b) Essay type question from Unit-4

5. a) Essay type question from Unit-5

   Or

   b) Essay type question from Unit-5

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## SECTION-B

**Short Answer Type Questions** *Marks* : 5x5M = 25M

Answer any Five out of the following Ten questions

6. Short answer type question from Unit-1
7. Short answer type question from Unit-1
8. Short answer type question from Unit-2
9. Short answer type question from Unit-2
10. Short answer type question from Unit-3
11. Short answer type question from Unit-3
12. Short answer type question from Unit-4
13. Short answer type question from Unit-4
14. Short answer type question from Unit-5
15. Short answer type question from Unit-5

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# HOD
# Personal Profile

1. Personal details:

   **a.** Name of the Faculty : M.B.JULIUS ISSAC RAJ

   **b.** Department : ELECTRONICS

   **c.** Designation : Asst.Professor (Selection Grade)

   **d.** Subjects Taught : ELECTRONICS at Graduate levelVLSI DESIGN, Data Communications, Micro Controller, Micro Processor, Basic Circuit Theory, Digital Electronics, ARM Technologies.

   **e.** Level of Guidance & Teaching : -

   **f.** Qualification: M.Sc., (Electronics), M.B.A.,B.Ed.,

   **g.** Teaching Experience : Graduate level - 9 years,

   **h.** Academic Degrees:

| Degree | University/Board | Date/Year | Awarded/Grade/Class |
|---|---|---|---|
| M.B.A | JNTUA, Anantapuramu | 2016 | Distinction |
| M.Sc., (Electronics) | Osmania University, Hyderabad, Telangana. | 2012 | First Class |
| B.Ed., | Sri KrishnaDevaraya University, Anantapur | 2010 | First Class |
| B.Sc., (M.E.Cs) | Sri KrishnaDevaraya University, Anantapur. | 2009 | Second Class |
| Intermediate | BIE, Andhra Pradesh | 2006 | Second Class |
| S.S.C. | Board of Secondary School Education, AP | 2002 | Second Class |

**Infrastructure facilities**:

**Library:** There is a central library to cater to the need of the students. Department does not have a library. But the complimentary copies provided by different publisher are provided in the department for the use of the student.

**Internet facility for staff and students**: Yes (only for staff )

Classroom with ICT facility:

Yes Laboratories: Yes. Department has one single lab