Phone : 08819 - 246126 / 246926 Website : www.svkpandksrajucollege.org.in

S.V.K.P. & Dr. K.S. RAJU ARTS & SCIENCE COLLEGE
(Autonomous)
Recognized by UGC as "College with Potential for Excellence"
Accredited by NAAC with "A" Grade
(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognised by Govt. of Andhra Pradesh)
PENUGONDA-534 320, West Godavari District., (A.P.)

I Semester Syllabus w.e.f (2020-21Admitted Batch)

SEMESTER-I

CIRCUIT THEORY AND ELECTRONIC DEVICES

Work load :60Hrs Per Semester/ 4Hrs/Week

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. Circuit analysis-loop current method, Nodal Voltage method.

UNIT II: (12hrs)
NETWORKS THEOREMS (D.C):
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.
FET: Construction, working and characteristics of JFET.
MOSFET construction and working, Characteristics.Advantages of FET overBJT.

UNIT V: (12hrs)
POWER SUPPLIES & PHOTO ELECTRIC DEVICES
Rectifiers: Half wave, full wave and Bridge Rectifiers-Efficiency-ripple factor.
Filters- L-section & π-section filters(qualitativeonly). Three terminal fixed voltage
I.C. regulators (78XX&79XX)., Light Emitting Diode and Photo diode.

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II Semester Syllabus w.e.f(2020-21 Admitted Batch)

SEMESTER-II

DIGITAL ELECTRONICS

Work load :60Hrs Per Semester/ 4Hrs/Week

UNIT I : (12hrs)

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

UNIT II: (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital IC logic gates, NAND & NOR as universal 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, 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 (NAND Gate), CMOS Logic (NORGate) operations with truth tables. Differences between CMOS and TTL logic families.

UNIT IV: (12hrs)

SEQUENTIAL DIGITAL CIRCUITS: **Flip Flops**: S-R FF, Clocked RS FF,D FF, Edge triggering J-K FF, Master-Slave JK FFs, Conversion of JK FF into D and T FFs. **Registers:** -SerialInSerialOut and ParallelIn and Parallel Out. **Counters:** Asynchronous Ripple counter (Mod-16), Mod-10. Synchronous counter- 4-bit parallel binary counter.

UNIT V: (12hrs)

MEMORY DEVICES:

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

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III Semester Syllabus w.e.f(2020-21 Admitted Batch)

SEMESTER-III

ANALOG CIRCUITS AND COMMUNICATION ELECTRONICS

Work load :60Hrs Per Semester/ 4Hrs/Week

UNIT- 1: (12Hrs)
OPERATIONAL AMPLIFIERS: Definition of OP-amp, Characteristics of Op-Amp, Block diagram of op-amp, concept of virtual ground,op-amp parameters, inverting, non-inverting summing amplifiers analysis. Subtractor, voltage follower, integrator, differentiator, Logarithmic amplifier.

UNIT II: (12hrs)
OP-AMP CIRCUITS: voltage regulator, comparator, Schmitt trigger. Sine wave generator, Square wave generator, Active filters (Basics)-low pass, high pass filters, IC-555 –functional block diagram and mention its applications

UNIT III: (12Hrs)
AMPLITUDE MODULATION: Need for modulation, Expression for amplitude modulation-frequency spectrum, bandwidth of AM, power relations in the AM wave. Generation of AM- Transistor modulator. Detection of AM signals: Necessity for detection – Diode detector.

UNIT IV: (12hrs)
FREQUENCY MODULATION: Theory of FM, Frequency deviation and carrier swing, modulation index, deviation ratio, Percent modulation. Mathematical representation of FM wave, frequency spectrum and bandwidth of FM waves, Generation of FM signals – Reactance modulator. Detection of FM waves – Ratio detector.

UNIT-V (12hrs)
RADIO BROADCASTING AND RECEPTION: Spectrum of electromagnetic waves, Radio broadcasting and reception, A Transmitter, AMreceiver- block diagram approach, Super heterodyne receiver. FM receiver- Block diagram.

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IV Semester Syllabus w.e.f(2020-21 Admitted Batch)

SEMESTER-IV(A)

MICROPROCESSOR SYSTEMS

Work load :60Hrs Per Semester/ 4Hrs/Week

UNIT I: (**12Hrs)**
8085*μP*ARCHITECTURE: Introduction to Microprocessor, Intel 8085 *μP* Architecture, register organization, Pin configuration of 8085. Instruction Set, Addressing modes, Timing diagrams, interrupts of 8085.

UNIT II: (12Hrs)
Assembly Language Programming using 8085, Programmes for Addition, Subtraction, Multiplication, Division, largest and smallest number in an array. Ascending and descending order of given array of numbers.

UNIT III: (12 Hrs)
8086 Microprocessor: Architecture, Pin description. Basic 8086 Configurations – Minimum mode and Maximum Mode,Instruction format, addressing modes. Interrupt Priority Management

UNIT IV: **(12Hrs)**
I/O Interfaces: Serial Communication, Parallel Communication, Keyboard and display, DMA controller (8257)
UNIT V: (12Hrs) ARM PROCESSOR: Introduction to 16/32 bit processors, Armarchitecture& organization, Arm based MCUs, Instructionset.

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 SAGibson
3. Microcontrollers Architecture Programming, Interfacing and SystemDesign–RajKamal Chapter: 15.1, 15.2, 15.3,15.4.1
4. 8086 and 8088 Microprocessor by Tribel and AvatarSingh

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 – NewAge
4. The Intel Microprocessors – Architecture, Programming and Interfacing – Bary B. Brey.
5. Arm Architecture reference manual –Armltd.

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IV Semester Syllabus w.e.f(2020-21 Admitted Batch)

SEMESTER-IV(B)

MICROCONTROLLER AND INTERFACING

Work load :60Hrs Per Semester/ 4Hrs/Week

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, Pin diagram of 8051. program counter and memory organization, Data types and directives, PSW register, Register banks and stack, 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. Timer/Counter Programming,

UNIT IV: (15Hrs)
Assemble language programming Examples: Addition, Multiplication, Subtraction, division, largest, smallest.

UNIT V: (15Hrs)
Interfacing and Application of Microcontroller: Interfacing of – PPI 8255,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, cengagepublishers
2. The 8051 microcontrollers and Embedded systems - By Muhammad Ali Mazidi and Janice GillispieMazidi – 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

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V Semester Syllabus (w.e.f 2020-21 Admitted Batch)

III B.Sc	Semester – V	Hrs/Wk:4
20ELE5A1	Industrial Electronics	*Total Hours: 60*

UNIT I: (20 hours)

Rectifiers and filters: Rectifiers– Half wave, full-wave and bridge rectifiers- Efficiency- Ripple factor- Regulation – Harmonic components in rectified output – Types of filters- Choke input (inductor) filter- Shunt capacitor filter- **L** section and $\boldsymbol{\pi}$ section filters.

Voltage Regulators: Transistor Series voltage regulator - Transistor Shunt voltage regulator – Three terminal regulators (78XX and 79XX).

UNIT II: (10 hours)

Power Supplies: Block diagram of regulated power supply – A simple regulated transistorized power supply (circuit and working) – Principle and working of switch mode power supply (SMPS).

UNIT III: (10 hours)

Voltage Multipliers: Half wave voltage doubler, Full wave voltage doubler, Voltage Tripler circuit diagram and working mentioning of applications of voltage multipliers.

UNIT IV: (10 hours)

Controlled rectifiers: SCR Half wave rectifier circuit, working with wave forms, mathematical analysis for resistive load - SCR Full wave rectifier circuit, working with wave forms, mathematical analysis for resistive load – SCR as inverter parallel and series circuits.

UNIT V: (10 hours)

Heat effects: Resistance, inductance and dielectric heating. Principle of operations and its applications. Dielectric Properties: Introduction, effect of a dielectric on the behavior of a capacitor, dielectric losses, significance of the loss tangent.

REFERENCE BOOKS:

1. Unified Electronics Volume II by J.P Agarwal and Amit Agarwal.
2. Industrial Electronics, S.B. Biswas, Dhanapur Rai & Sons.
3. Industrial Electronics, G.K. Mithal, Khanna Publishers.
4. Electronic Devices and Circuits – G.K. Mithal.
5. Electronic Devices and Circuits-Millman and Halkias- Tata Mc Graw Hill (TMH)
6. Microelectronics- J. Millman A. Grabel - TMH

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V Semester Syllabus (w.e.f 2020-21 Admitted Batch)

III B.Sc	Semester – V	Hrs/Wk:4
20ELE5A2	Electronic Instrumentation	*Total Hours: 60*

UNIT I: ***Introduction To Instruments*** **(15 hrs)**

Types of electronic Instruments - Analog instruments & Digital Instruments, DC Voltmeter and AC Voltmeter, Construction and working of an Analog Multimeter and Digital Multimeter (Block diagram approach), Sensitivity, 3½display and 4½ display Digital multimeters, Basic ideas on Function generator. Block Diagram of Function Generator.

UNIT II: ***Oscilloscope*** **(10 hrs)**

Cathode Ray Oscilloscope-Introduction, Block diagram of basic CRO, Cathode ray tube, Electron gun assembly, Screen for CRT, Time base operation, Vertical deflection system, Horizontal deflection system, Use of CRO for the measurement of voltage (AC and DC),frequency, phase difference, Different types of oscilloscopes and uses.

UNITIII:*Transducers* **(15hrs)**

Classification of transducers, Selection of transducers, Resistive, capacitive & inductive transducers,Resistive and capacitive touch screen transducer used in mobiles, Displacement transducer-LVDT, Piezoelectric transducer, Photo transducer, Digital transducer, Fibre optic sensors

OVERVIEW OF OPTICAL FIBER COMMUNICATION: Introduction, Historical development, general system, advantages, disadvantages, and applications of optical fiber communication

UNIT IV: ***Display Instruments*** **(10 hrs)**

Introduction to Display devices, Seven Segment Displays, LED Displays, Construction and operation (Display of numbers),Types of SSDs (Common Anode & Common Cathode type), Limitations of SSDs, Liquid Crystal Displays, Applications of LCD modules.

UNIT V: ***Biomedical Instruments*** **(10 hrs)**

Basic operating principles and uses of (i) Clinical thermometer (ii) Stethescope (iii) Sphygmomanometer (iv) ECG machine (v) Radiography (vi) Ophthalmoscope (vii) Ultrasound scanning (viii) Pulse oxymeter (ix) Glucometer, Basic ideas of CT scan and MRI scan.

REFERENCE BOOKS:

1. Electronic Instrumentation by H.S.Kalsi , TMH Publishers
2. Electronic Instrument Hand Book by Clyde F. Coombs , McGraw Hill
3. Introduction to Biomedical Instrumentation byMandeep Singh, PHI Learning.
4. Biomedical Instrumentation and Measurements by Leslie Cromwell ,Prentice Hall India.
5. Electronic Measurements and Instrumentation by Kishor, K Lal, Pearson, New Delhi
6. Electrical and Electronic Measurements by Sahan, A.K., Dhanpat Rai, New Delhi
7. Electronic Instruments and Measurement Techniques by Cooper, W.D. Halfrick, A.B., PHI Learning, New Delhi
8. Web sources suggested by the teacher concerned and the college librarian including reading material.