VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY, BELLARY.

ELECTRONICS

SYLLABUS FOR THE UNDEGRADUTE COURSE

&

QUESTION PAPER PATTERN

FOR B.Sc., I Sem To VI Sem (PAPERS – I TO VIII)

VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE

B.Sc. First semester - Electronics

Paper - I. BASIC ELECTRONICS

No. o f teaching hours: 4 hours per week. Total no. of hours: 60

Chapter 1: Circuit fundamentals: 10 hours

Review the theory of passive components –R, L & C- features, types, uses.
color coding of resistors.& capacitors.
charging & discharging of capacitor & growth and decay of current in inductor through resister. Energy stored in capacitor & inductor.
transformer- features, construction & working, trans ratio, losses & types of transformers.
Energy sources - concept of voltage and current source- Characteristics.
Short & open circuits in series and parallel circuits. Zero reference and chassis ground.

Chapter 2: A.C circuits: 10 hours

Fundamentals of AC circuits, Characteristics of sine wave,
Basic definitions of sine wave- Amplitude, period, frequency, average & rms value, form factor, phase and phase difference , vector diagrams, complex numbers, J operator
Series RL, RC & RLC circuit fed with ac- determination of reactance, impedances and expression for current. Series resonance- expression for the resonant frequency, sharpness of resonance curve. Bandwidth and quality factor.
Parallel RLC circuit- resonance curve, Bandwidth and quality factor.
CRO& DMM: - Functions of cathode ray oscilloscope and digital multimeter and measurements various parameters using CRO & DMM.

Chapter 3: Network theorems: 10 hours

Statement, proof, explanation and problems of the following theorems

1. T & π Networks (star &delta) and their conversions
2. Voltage divider theorem
3. Kirchaffs laws
4. Reciprocity theorem
5. Maximum power transfer theorem
6. Superposition theorem
7. Thevinin’s theorem
8. Norton’s theorem

Chapter 4: Theory of semiconductors 10 Hours

Review of semiconductor materials, energy band theory of crystals
Intrinsic semiconductors- Atomic structure of Germanium and Silicon
Current Conduction and drift current in intrinsic semiconductors,

Extrinsic semiconductor – P-type and N-type, conduction in both types of semiconductors
Semiconductor diode - formation of P-N junction & depletion layer. Symbol
Working of P-N junction diode, I-V Characteristics in forward & reverse Bias.
Knee voltage, Breakdown voltage, junction capacitance, operating/rating/
Specifications of PN junction diode, diode testing & ideal diode characteristics.

Chapter 5: special purpose diodes 10 hours

Study the construction, working, characteristics and uses of the following special purpose semiconductor devices.
1. zener diode- zener diode regulator
2. varactor diode
3. light emitting diode & LCD-seven segment led display
4. photo diode
5. photocells (solar cells) – types of solar cells
6. schotky diode.

Chapter 6: Transistors 10 hours

The bipolar junction transistor, types and symbols,
working of NPN & PNP Transistor.
Transistor configurations- CB, CE & CC.
Current Amplification factors in - CB, CE & CC modes and their relations.
Transistors characteristics - input, output & transfer characteristics in CB,CE configurations for both npn & pnp transistors.
Leakage currents.

Special transistors-
Construction , working and characteristics of
FET, MOSFET, UJT & CMOS
Applications - FET as an amplifier, UJT as a relaxation oscillator.

Experiments for first sem: minimum 12 experiments to be performed (weekly two labs of three hours duration per section)

1. Verification of reciprocity theorem
2. verification and conversion of T & π networks
3. Verification of KCL & KVL
4. Verification of superposition theorem
5. Verification of maximum power transfer theorem
6. Verification of Thevenin's theorem
7. Series RLC circuit -determination resonance frequency
8. Parallel RLC circuit -determination resonance frequency
9. Measurement of Vpp, T, F of sine and square using CRO
10. I-V characteristics of PN junction diode

11. I-V characteristics of zener diode
12. LED characteristics of red & green LEDs
13. BJT- common base characteristics find Alfa (α)
14. BJT –common emitter characteristics find beta (β)
15. FET- characteristics determine parameters (Rd, gm &μ)

REFERENCE BOOKS:

1. Solid state electronics-by B.L. Theraja
2. Principles of electrons – by V.K. Mehta
3.Fundamentals of electrical &electronic engineering, B L Theraja
4.Eletronic devices &circuits, Jacob Millman & Halkias,
5.electronic device& circuits theory Robert boylsted & Louis Nashelsky-
6.Baisc electronics,B.Grob,8th Edition
7.Eletrical circuits &application, B.Grob

VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE

B.Sc. Second semester - Electronics

Paper – II. ELECTRONIC CIRCUITS

No. o f teaching hours: 4 hours per week. Total no. of hours: 60

Chapter 1: DC Regulated power supplies 10 hours

Block diagram of regulated power supply, Rectification: Half wave rectifier, center tapped Full wave rectifier and Bridge rectifier- determination of efficiency and ripple factors.
Filters: function of Series inductor filter, shunt capacitor filter, LC filter and CLC / filter.
Voltage regulators: zener diode regulator, series transistor and shunt transistor regulator and IC regulator 78XX and 79XX series. LM 317 & 337 regulator, SMPS

Chapter 2: Transistor Biasing: 10 hours

Need for biasing, essentials of transistor biasing
DC load line Analysis, Operating point- determination of operating point- problems.
Temperature effect on Q-point, Thermal Runaway.
Stability factor- definition & importance
Biasing circuits: - designing , stability factors of the following biasing circuits.
• Base resister bias / fixed bias
• Base bias with emitter Feed back
• Base bias with collector feed back
• Voltage divider/ universal biasing method.
- Problems

Chapter 3: Single stage transistor amplifier: 10 hours

CE amplifier with voltage divider network- circuit, function and AC equivalent circuits.
Hybrid parameter- definitions, CE, CC & CB hybrid equivalent models and expressions.
Derivations for voltage gain, current gain, input impedance and output impedance of CE amplifier in terms of h- parameters.

Chapter 3:Multistage transistor amplifier 10hours

Classification of amplifier based on different parameters, different amplifier couplings and their comparison
RC-coupled two stage amplifier freq.-response and band width
advantage of RC coupled amplifier
Transformer coupled amplifier –freq. response
Emitter follower circuit - construction, working and analysis. Darling ton pair of transistors

Chapter 5-power amplifiers 10hours

Transistor audio power amplifier. Difference b/w voltage and power amplifiers

Transformer coupled class –A power amplifiers –expression for maximum efficiency
Class-B push –pull amplifiers –power efficiency of amplifiers ,cross over distortion &harmonics distortion , complementary symmetry push pull amplifiers.
concept of heat sink used in power transistor
single tuned amplifiers

Chapter -6 Feed back in amplifier 10hours.

concept of feed back in amplifiers - positive & negative feedback
effect of –ve feed back on amplifier characteristics - expression for voltage gain ,input impedance ,output impedance & band width
Comparative study of negative feedback on amplifiers characteristics with positive feedback.

Experiments for second sem: minimum 12 experiments are to be performed for eligibility
(Weekly two labs of three hours duration per section)

1. Half- wave rectifier – determination of ripple factor with & without shunt capacitor filter.
2. Full -wave rectifier – determination of ripple factor with & without shunt capacitor filter.
3. Bridge- rectifier – determination of ripple factor with & without shunt capacitor filter.
4. Zener diode voltage regulator- load regulation curve.
5. Series Transistor voltage regulator- load regulation curve.
6. IC 78xx regulated power supply- load regulation curve.
7. IC 79xx regulated power supply- load regulation curve.
8. Single stage RC coupled amplifier- frequency response curve.
9. Emitter follower- determination of voltage gain, current gain, input impedance and output impedance.
10. Determination of hybrid parameters for the CE amplifier.
11. Determination of hybrid parameters for the CB amplifier.
12. Common source FET amplifier- Frequency response.
13. Complementary symmetry push pull amplifier.
14. Single tuned amplifier – frequency response.

Reference books:

1. Solid state electronics-by B.L. Theraja
2. Principes of electrons – by V.K. Mehta
3.Fundamentals of electrical &electronic engineering,BL Theraja,
4.Eletronic devices &circuits,Jacob Millman&Halkias,
5.electronic device& circuits theory Robert boylsted&Louis Nashelsky
6.Baisc electronics,B.Grob,8th Edition
7.Eletrical circuits &application,B.Grob
8Fundamentals of electronics – B.Basvaraj
9 Applied electronics – R S Sedha

VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE

B.Sc. Third Semester - Electronics

Paper - III. OSCILLATORS & OP-AMP

No. o f teaching hours: 4 hours per week. Total no. of hours: 60

Chapter 1:Wave Shaping Circuits 10 hours.

Introduction to linear and non linear wave shaping.
RC & RL differentiating circuits- derivation , input and output wave forms.
RC & RL integrating circuits- derivation , input and output wave forms.
non - linear wave shaping- positive, negative clippers. biased - positive, negative clippers & combination clipper.
Clamping circuits- positive and negative clampers

Chapter2. Sinusoidal Oscillators 10 Hours

Classification of oscillators. Damped & un damped oscillator.
The oscillatory circuit (tank circuit). essentials of transistor oscillator- barkhausen criterion.
Transistor LC oscillator: Hartley oscillator and Colpitts oscillator limitations of LC & RC oscillators. Transistor crystal oscillator: working of quartz crystal, equivalent circuit of crystal frequency response of transistor crystal oscillator.

Chapter 3: Non sinusoidal oscillators 10hours

Non sinusoidal wave forms, classification, Definitions of pulse parameters, time delay, rise time, turn on, turn off, storage time, fall time, pulse width and duty cycle.
Multivibrators: types and uses, construction and working of Astable, Monostable and bistable multivibrators Schmitt trigger using transistors and 555 timer.

Chapter 4: Operational Amplifier 10 hours

Introduction, advantages and disadvantages of IC technology, IC packages, scale of integration, IC terminology,
Emitter coupled differential amplifier- differential and common mode operation, CMRR, block diagram of OPAMP. Characteristics of ideal OPAMP. Inverting and non inverting opamp expressions
for closed loop voltage gain, op amp parameters- input bias current, input offset
voltage, output offset voltage and input and output impedances, CMRR and slew rate, frequency compensation, null adjustment,

Chapter 5: OPAMP Applications 10 hours

OPAMP as an integrator , differentiator- circuit function and wave forms

Active filters- OPAMP low pass, High pass, band pass and band reject filters- circuit construction, function and frequency response.
OPAMP oscillators- comparator, Schmitt trigger phase shift oscillator, wein bridge oscillator, astable, bistable and monostable multivibrator- circuit and working.

Chapter 6: Analog computation 10 hours

Introduction, linear computing circuits and symbols using OPAMP- scale changer, adder, sub tractor, multiplication by a constant.
Solutions of linear ordinary differential equation with constant coefficients (Bootstrap method).
Analog computer symbols, operation modes of analog computer, time scaling and amplitude scaling, examples.

Experiments: minimum 12 experiments are to be performed for eligibility. (weekly two labs per section each of three hours duration)

1. Colpitt's oscillator(using transistor)- determine the frequency of oscillation
2. Hartley oscillator(using transistor)- determine the frequency of oscillation
3. Phase shift oscillator(using transistor)- determine the frequency of oscillation
4. Wien bridge oscillator(using transistor)- determine the frequency of oscillation
5. Crystal oscillator(using transistor)- determine the frequency of oscillation
6. Inverting & non inverting op-Amp – determination of gain
7. Frequency response of inverting op-Amp
8. Frequency response of Non-inverting op-Amp
9. Phase shift oscillator(using op-Amp)- determine the frequency of oscillation
10. Wien bridge oscillator(using op-Amp)- determine the frequency of oscillation
11. Active low pass filter- Frequency response
12. Active high pass filter- Frequency response
13. Determination of op-Amp parameters
14. Op Amp as a differentiator& 15 Op-Amp as an integrator

REFERENCE BOOKS:

1.Operatinal amplifiers &linear integrated circuits ;Ramakanth Gayakwad,
2.Electronics devices &circuit theory; Robert Boylestead & Louis Nashelsky
3.Operational amplifiers &linear integrated circuits by Robert F.Coughlin&Frederick F.Driscoll,
4.Electronic principles, AP Malvino,
5.Integrated circuits ,KR Botkar & 6. Analog computation & simulation by V. Rajraman

VIJAYANAGARA SRI KRISHNADEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE.

B.Sc. Fourth Semester - Electronics

Paper IV- DIGITAL ELECTRONICS & C- PROGRAMMING

No. o f teaching hours: 4 hours per week. Total no. of hours: 60

Chapter: 1) NUMBER SYSTEMS & BOOLEAN ALGEBRA: 10 HOURS

Binary, Octal & Hexadecimal systems and their inter conversions.
Codes- BCD (8421), Excess- 3 code, Gray code, Binary operations- addition, subtraction, 1' & 2' complementary method of subtraction. Examples.
BOOLEAN ALGEBRA: positive, negative logics, Boolean identities. Laws and Theorems of Boolean algebra. Demorgan's theorems. Simplifications of Boolean expressions using laws & theorems.

Chapter 2: LOGIC GATES & LOGIC DESIGN 10 HOURS

Introduction, AND, OR, NOT – Basic gates: construction, working using diodes and transistors. Truth tables, symbols and IC's.
Universal gates: NAND & NOR gates truth tables, symbols & Boolean expressions.
Combinational gates: XOR & XNOR gates truth tables, symbols & Boolean expressions.
Binary adder: Half adder & Full adder, 4-bit Binary adders.
Logic design: Implementation of logic circuits for given Boolean expressions and design. Simplifying the logic circuits SOP & POS expressions, K-Map construction & simplifications to solve 3 & 4 variable Boolean expressions, don't care conditions.

Chapter 3: LOGIC family IC's & Flip-flops 10 HOURS

RT, DTL & TTL families – characteristics, TTL NAND & NOR gates, CMOS series, Merits and demerits of TTL & CMOS.
Flip-flops: Basic RS flipflop (bistable) using transistor.
Flipflop as a memory cell. RS- NAND & NOR latches, clocked RS flipflop, D & T flipflop, JK flipflop, master slave flipflop.

Chapter 4: 'C' PROGRRAMING 10 HOURS

Basic computer system- block diagram &function, hardware, software.
Introduction to 'C' language, characteristics and applications, character set, C- tokens, constants and variables, data types, operators- arithmetic, logical, bitwise and special operators, Expressions, Basic structure of 'C' programming, compiling and executing of 'C' programs.

Chapter 5: STATEMENTS OF 'C' LANGUAGE: 10 HOURS

Statement and examples with programs for the following-
Conditional control statements:
1) if statement.
2) If-else statement.
3) nested-if statement.
4) switch statement.
Unconditional control statements:
5) go-to statement.
Loop control statements:
6) while statement.
7) do while statement.
8) for statement.
9) nested for statement.
10) jump statements

Chapter 6: ARRAYS & FUNCTIONS: 10 HOURS

Arrays :

- Definitions, classification, declaration.
- One dimensional and two dimensional arrays and examples.

Functions:

- Definitions, Arguments & parameters, category of functions, function declarations.
- Parameter passing mechanisms- call by value, call by reference
- Recursion- examples.

Experiments: minimum 12 experiments are to be performed for eligibility. (weekly two labs per section each of three hours duration)

1) Construction of Basic logic gates using diodes and transistor.
2) Verification of IC – logic gates OR(7432), AND(7408), NOT(7404), NAND (7400), NOR (7402), X-OR (7486).
3) Verification of De' Morgan's theorems.
4) Realization of basic gates using universal gate –NOR
5) Realization of basic gates using universal gate –NAND
6) Construction of NAND, NOR latches.
7) Construction of RS flip-flop.
8) Construction of JK flip-flop.

C- programs:

9) Program to find the Simple interest and Compound interest.
10) Program to find the Smallest and largest of three given numbers.
11) Program to find the sum of Sine Series.
12) Program to find the sum of individual digits of given number.
13) Program to check prime number.
14) Program to print the Fibonacci Series.
15) Program to find the roots of Quadratic equation using switch statement.

16) Program to find the Factorial of a number using functions.
17) Program to find the Length & check Palindrome of a given string.

REFERENCE BOOKS:

1.Computer concept & ‘C’ programming - P.B.Kotur.
2.Digital fundamentals - Flyod,
3.Digital system –principles & application; Ronald J Tocci,
4.Modern digital electronics,RP Jain
5.Digital principles & applications ; Malvino&Leach-
6.Digital logic &computer design;M Morris Mano –,new edition.

VIJAYANAGARA SRI KRISHNA DEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDERGRADUATE COURSE.

B.Sc. Fifth semester – Electronics

Paper: V- Electronic communication

No. o f teaching hours: 3 hours per week. Total no. of hours: 50

Chapter - 1: Antennas and radio wave propagation 10 hours

Antenna requirements, antenna parameters, resonant antenna, dipole antenna, folded dipole antenna, reflectors, directors and yagi-uda antenna.
EM theory- qualitative analysis of electromagnetic theory, Maxwell's equations,(no derivations) pointing theorem
Propagation of radio waves, ionosphere-formation and composition, mechanism of radio wave propagation, different modes of radio wave propagation (qualitative analysis).

Chapter – 2: Transmission lines (T-lines) 10 hours

Introduction to T- lines, Types of T- lines, distributed parameters of T- lines, basic T- line equation, characteristic impedance, impedance matching, propagation constant (attenuation and phase constants), frequency and phase distortion, condition for distortion less T- line, Standing wave ratio (SWR) and VSWR.

Chapter – 3: Amplitude modulation (AM) 10 hours

Define modulation, Need for modulation, different types of modulations – AM, FM and PM, Expression for instantaneous voltage of AM waves, modulation index, frequency spectrum and bandwidth, power relation in AM waves, SSB transmission and its advantages.
AM modulators - emitter modulator, base modulator and collector modulation.
AM detectors- square law diode detector and linear diode detector.

Chapter – 4: Frequency modulation (FM) 10 hours

Advantages of FM over AM, Expression for instantaneous voltage of frequency modulated wave, modulation index and international standards on FM broadcasting.
FM modulator - varactor diode modulator and theory of FET reactance modulator,
FM detectors- slop detector, balanced slop detector and Foster-seelay discriminator.

Chapter – 5: Transmitters and Receivers 10 hours

Function of AM transmitters and FM transmitters with block diagrams, Receiver characteristics, AM-TRF receiver and super heterodyne receivers, need for Automatic gain control (AGC) circuit.
FM super heterodyne receiver explanation with block diagram, comparison of AM &FM receivers.

Experiments: paper –V (minimum 8 experiments to be performed)

1. RC Differentiator and Integrator (Trace input and output waveforms for sine, square and triangular waves).
2. Clipping Circuits – Positive, Negative and Biased.
3. Clamping Circuits - Positive, Negative and Biased.
4. Linear Ramp Generator using UJT.
5. Construction of Astable Multivibrator using IC 555.
6. Schmitt Trigger using IC 555.
7. Construction of Mono and Bistable Multivibrator using IC 741.
8. Two Stage RC Coupled Amplifier-Frequency Response.
9. Amplitude Modulator using Transistor.
10. A M Detector using Linear Diode Detector.
11. IF Amplifier.
12. Study of Pre-Emphasis and De-Emphasis Circuits.
13. Frequency Response of Loud Speaker.
14. Study of Characteristics of Receiver – Sensitivity, Selectivity and Fidelity.
15. Double Tuned Amplifier.
16. Study of AGC Circuit (in AM detector).
17. Frequency Response of Microphone.

Reference Books:

1. Electronic Communication Systems – George Kennedy,.
2. Electronic Communication – Sanjeev Gupta. 3.
Electronic Communication – Roddy and Coolen.
4. Radio Engineering – GK Mittal.
5. Handbook of Electronics – Gupta and Kumar.
6. Basic television – Vernod Grob.
7. TV Fundamentals – A Dhake.
8. Basic TV Transmission and Reception – AK Maini.

VIJAYANAGARA SRI KRISHNA DEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE.

B.Sc. Fifth semester - Electronics

Paper: VI- Digital circuits and microprocessor

No. o f teaching hours: 3 hours per week. Total no. of hours: 50

Chapter - 1: Registers and counters 10 hours

Introduction, types of registers,4- bit serial in serial out, serial in parallel out, parallel in serial out and parallel in parallel out shift registers. Asynchronous counters logic diagram, truth table and timing diagram, 3-bit ripple counter, 4-bit up-down counter and modified counters – mod-3, mod-5, mod-7. 4- bit synchronous counter decade counter, IC7490. Synchronous updown counter, design using K-map, ring counter and applications.

Chapter – 2: Data processing circuits and converters 10 hours

Multiplexers: block diagram, truth table and logic circuit of 4-to-1 multiplexer and 16 to-1multiplexer .The 74150 TTL multiplexer-pin out diagram, truth table explanation
Demultiplexer-1-to4, 1-to-16 demultiplexer block diagram, truth table and logic diagram and explanation. The 74154demultiplexer-pin out diagram, truth table explanation
Data converters- D to A converters-Binary weighted resister network and R-2R ladder network.
A to D converters- Dual slope integrating type, successive approximation method, flash converter, resolution and accuracy for the above converters.

Chapter – 3:Memory Devices 10 hours

Basic memory cell, classification, primary and secondary memories. Semiconductor memories- diode matrix, Magnetic memory, hard disc and floppy disc, optical memory-CD ROM, CD-RW and DVD.
RAM- static and dynamic cells, ROM, EPROM, EEPROM, CCD's,

Chapter – 4: 8085Microprocessor 10 hours

Introduction to 8085 based microcomputer system, 8085 MPU, Architecture and pin configuration of 8085, Flags and special purpose registers.
Instruction and timings- instruction classification, instruction format, instruction timing and operation status, instruction set, addressing mode and groups, instruction cycle.

Chapter – 5: 8085 programming and interfacing 10 hours

Programs on Data transfer instruction, arithmetic operation, logic operation, branch operation, flow chart and executing, writing assembly language programs.
Need of interfacing devices, parallel and serial interfacing, PPI 8255, USART8251

Experiments: paper –VI (minimum 8 experiments to be performed)

1. Study of Multiplexer and using IC 74LS150.
2. Study of Demultiplexer using IC 74LS154.
3. Construction of DAC using R-2R ladder network.
4. Transfer of Data from various registers of 8085.
5. 1`s and 2`s Complements of 8-bit numbers using 8085
6. Addition and Subtraction of two 8-bit numbers using 8085
7. Addition of two 16-bit numbers using 8085
8. Larger among two hexadecimal numbers using 8085
9. Smaller among two hexadecimal numbers using 8085
10. Arranging the numbers in ascending order using 8085
11. Arranging the numbers in descending order using 8085
12. Finding the square root of a number using 8085
13. Interfacing 8-bit DAC and generating different waveforms.
14. Four bit binary counter using IC 7476
15. Interfacing 7- segment LED display and display of alphanumeric characters.
16. Interfacing 8-bit ADC.

Reference Textbooks:

1. Modern Digital Electronics – RP Jain,
2. Digital Principles & applications – AP Malvino,
3. Microprocessor – Architecture, Programming and applications- RA Goankar .
4. Fundamentals of Microprocessors and Microcontrollers – B Ra, Dhanpat Rai
5. Microprocessors and Digital Systems – DV Hall,

VIJAYANAGARA SRI KRISHNA DEVARAYA UNIVERSITY , BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDER GRADUATE COURSE.

B.Sc. Sixth semester – Electronics

Paper: VII- Television and digital communication

No. o f teaching hours: 3 hours per week. Total no. of hours: 50

chapter I: Basic television principles 10 hours

Introduction, Elements of TV broad casting system, block diagram and function of monochrome TV transmitter & receiver,
Scanning- aspect ratio, progressive, horizontal, vertical, & interlaced scanning,
composite video signal, blanking and synchronizing pulses, channel band width, CCIR –B TV channels allotment of frequencies,
Camera tubes-introduction, types, construction, working and characteristics of vidicon and image orthicon camera tubes.

chapter 2: Colour television 10 hours

Introduction, essentials of CTV , mixing of colours, additive &subtractive mixing, colour TV signals, luminance and chrominance signals, colour TV camera, colour sub carrier frequency, PAL colour TV system, PAL encoder & decoder, colour picture tube, block diagram & function of colour TV receiver,

chapter 3: Satellite communication 10 hours

Introduction, kepler's laws, (statements only) satellite orbits, circular, elliptical & geosynchronous satellite orbits, satellite links, the uplink & downlink, the transponder, path loss, multiple access methods,- Qualitative study of FDMA, TDMA, CDMA,
cellular/mobile communication, requirements, PCS system, computer network,- LAN&WAN, internet & its services,

chapter 4: Digital communication 10 hours

Introduction & basic digital communication, pulse modulation systems, PAM, PTM , PWM &PPM,
Synchronous and Asynchronous transmission, probability of bit error, matched filter,
Pulse code modulation systems, block diagram &working of PCM system, delta modulation, digital
carrier systems, Block diagram &function of ASK, FSK, PSK, QPSK &DPSK

chapter 5: Optic fibers & communication 10 hours

Introduction, block diagram & function of optical communication system, advantages of optical communication, optical fiber & cable, types of optical fibers, modes of propagation, step index & graded index fiber, single and multimode fibers, propagation of light within a fiber Launching angle
expression for numerical aperture(NA) , fiber materials,

Experiments: paper –VII (minimum 8 experiments to be performed)

1. Photo transistor characteristics.
2. Half adder and full adders using IC's
3. BCD seven segment conversion using IC 74LS47
3. Precision Full-wave Rectifier using OP-Amp.
4. Temperature Transducer and its response curve.
5. Four bit binary adder using IC7483
6. Study of PAM, 7. Study of PWM.
8. Study of PPM., 9.Study of ASK
10. Study of FSK, 11. Study of PSK.
11. 1`s and 2`s Complements of 8-bit numbers using 8051 microcontroller
12. Addition and Subtraction of two 8-bit numbers using 8051 microcontroller
13. Addition of two 16-bit numbers using 8051 microcontroller
14. Larger among two hexadecimal numbers using 8051 microcontroller
15. Smaller among two hexadecimal numbers using 8051 microcontroller
16. Seven segment LED Interfacing with Intel 8051 microcontroller through PPI.
17. Relay Interfacing with Intel 8051 microcontroller through PPI.
18. Stepper motor interfacing with 8051 microcontroller through PPI.

Reference Books:

1. Electronic communication – Sanjeev gupta
2. Electronic communication- Roody & coolen
3. principles of communication system- taub & schilling
4. Fibre optic communication – G.kisser
5. Basic digital & analog communication systems – B PLathi
6. Basic television – Bernold Grob

VIJAYANAGARA SRI KRISHNA DEVARAYA UNIVERSITY, BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDEGRADUTE COURSE

B.Sc. sixth semester - Electronics

Paper: VIII- Instrumentation and Microcontroller

No. o f teaching hours: 3 hours per week. Total no. of hours: 50

Chapter - 1: Instrumentation-Sensors and applications 10 hours

Resistance type temperature sensors- metallic resistance thermometer, semiconductor resistance thermometer (thermistors), thermocouples, solid state sensors, quartz thermometers.
Radiation type sensors - optical pyrometers.
Displacement and strain transducers: LVDT, strain gauge-type of strain gauges, material for strain gauge. Pressure transducer: elastic transducer, bourdon or helical tubes, piezoelectric pressure transducer.

Chapter – 2: Signal Conditioners 10 hours

Filters- integrators, differentiators and active filters- low pass, high pass, band pass, band rejection filters
Precision rectifier using opamp, peak detectors, sample and hold circuits, phase sensitive detector, instrumentation amplifier, isolation amplifier, lock in amplifier.

Chapter – 3: 8051Microcontroller 10 hours

Microcontroller and embedded processors, overview of 8051 family, 8051 architecture, registers and memories in 8051, register banks, flag bits, PSW register, data types, JUMP, LOOP and CALL instructions.

Chapter – 4: 8051 Addressing modes and Instruction set 10 hours

I/O programming of 8051- I/O programming, bit manipulation, addressing modes, arithmetic, logical and single bit instructions and programming.

Chapter – 5: 8051 Timer/Counter Programming and Interfacing 10 hours

8051 Timer/Counter programming, TCON register, Baud rate and Interrupts in 8051, stepper motor description and stepper motor interfacing via ULN2003, interfacing of ADC and DAC to 8051

Experiments: paper –VIII - project work:

Construction of simple projects by the students and submission of report with project in the practical examination for evaluation, explanation of working of the circuit used in the project.

Reference books:

1. Transducers and instrumentation- DVS Murthy
2. The 8051 Microcontroller and embedded systems- Ali Mazidi and Janice Mazidi
3. 8051 microcontroller architecture, programming and applications – KJ Ayala
4. Microcontrollers (Theory and applications) – Ajay V Deshmukh

VIJAYANAGARA SRI KRISHNA DEVARAYA UNIVERSITY, BELLARY.
ELECTRONICS – SYLLABUS FOR THE UNDEGRADUTE COURSE

QUESTION PAPER PATTERN FOR B.Sc. I SEM TO VI SEM (PAPERS – I TO VIII)

Time: 3 hours maximum marks; 70

SECTION- A (2 mark questions)

Answer any five questions **5X2=10**

1. a)
b)
c)
d)
e)
f)
g)

SECTION –B (5 mark questions)

Answer any Four questions **4X5=20**

2.
3.
4.
5.
6.
7.

SECTION – C (10 mark questions)

Answer any four questions **4X10=40**

8.
9.
10.
11.
12.
13.
