

D.B.F. Dayanand College of Arts and Science, Solapur

Program Outcome [B.Sc. Electronics]

Bachelor of Science (B.Sc.) in Electronics is the course disseminating knowledge of the subject from fundamental concepts to State-of- technologies. Indeed, the curriculum encompasses knowledge of various themes such as Microcontroller and Embedded System, Instrumentation, Communication Electronics, Power Electronics, Medical Electronics, Virtual instrumentation etc.

- The students exposed to the recent technologies.
- The students can design and implement the instrumentation of significant preciseness.
- The students are ready to perform the projects of industrial standards, which could also, ensures the interdisciplinary approach.

- Specific practical skills is developed among the students.
- The skills for accepting challenges of upcoming technological advancements is inculcated.
- Upon completion of this course students will acquire in-depth understanding of Communication Electronics, Industrial Electronics, Microcontrollers, Assembly Language Programming, and Interfacing.

- The students can be employed in the field of power sector, defence services, TV and music industry, automation, IT, optical communication.
- They can work as : – Electronic Circuit Designer – Electronic Consultant (Installation and maintenance of Electronic consumer Products)

D.B.F. Dayanand College of Arts and Science, Solapur

COURSE OUTCOME

Name of Department: ELECTRONICS

B.A. / B.Sc. / M.A. / M.Sc.	B.Sc.	
NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem I	
COURSE NUMBER (PAPER NUMBER)	Paper I	
TITLE OF COURSE (NAME OF PAPER) Basic Circuit Theory and Network Analysis		
COURSE CONTENT	OBJECTIVES	OUTCOME
Circuit Elements Active and passive elements, Resistors, Capacitors, Inductors, Transformers, Relays and Fuses	To get the knowledge about the electronic components.	The student can understand the electronic component
Circuit Fundamentals DC sources, Constant voltage and current sources, AC sources, Sinusoidal and non sinusoidal sources, RMS current and voltage, Phase relationship of current and voltage with pure resistor, capacitor and inductor.	To get the knowledge about the circuit fundamentals	The student can understand the circuit fundamentals.
AC Circuits Series and Parallel RLC circuits, Phase diagram, Impedance, Admittance, Series and Parallel resonance, Response curve, Band width, Quality factor	To get the knowledge about the AC circuit	The student can understand the AC circuits.
Network Theorem Kirchhoff's Laws, Mesh and Nodal analysis, Thevenin's Theorem, Norton's Theorem, Superposition Theorem, Millman's Theorem, Maximum power transfer theorem	To get the knowledge about the network theorem.	The student can understand the network theorem.
Two Port Network Black box theory, Concept of equivalent network, Z, Y, H & Transmission (ABCD)parameters, T-network, π -network and their interconversion Expressions only.	To get the knowledge about the two port network.	The student can understand the two port network .

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem I	
COURSE NUMBER (PAPER NUMBER)	Paper: II	
TITLE OF COURSE (NAME OF PAPER)	Digital Fundamentals	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Number Systems Binary, Octal, Decimal, Hexadecimal number systems and their inter conversions, 1's compliment, 2's compliment, Arithmetic operations, Signed binary numbers	To get the knowledge about number system	The student can identify the numbers.
2. Binary Codes 8421 code, Excess-3 code, Gray code, ASCII code, Parity bit	To get the knowledge about binary codes.	The student can identify the binary codes.
3. Logic Gates OR, AND, NOT, NAND, NOR, Ex-OR, Ex-NOR gates, Positive and Negative logic, De Morgan's Theorems, Universality of NAND and NOR gates, Study of IC 7400, 7402, 7404, 7408, 7432, 7486	To get the knowledge about logic gates.	The student can identify the logic gates eg OR,AND,NOT etc
4. Boolean Algebra Rules and laws of Boolean algebra, Simplification of Boolean expression, Kmap, K-maps for 2, 3 and 4 variables, Use of K-map for reduction of Boolean expressions	To solve the logical Boolean equation by using Kmap	The students can analysis Kmap.
5. Arithmetic Circuits Exclusive OR gate as a Binary to Gray converter, Parity checker, Controlled inverter, Half adder, Full adder, Parallel binary adder, Half and Full subtractor, Block diagram of digital computer and its organization	To study the arithmetic circuits	Students can solve the arithmetic circuits.

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem II	
COURSE NUMBER (PAPER NUMBER)	Paper: III	
TITLE OF COURSE (NAME OF PAPER)	Semiconductor Devices	
COURSE CONTENT	OBJECTIVES	OUTCOME
Semiconductor and p-n Junction Intrinsic and extrinsic semiconductors, Formation of p-n junction, Barrier potential, I-V characteristics, Diode equation, Static and dynamic resistance, Junction capacitance	To get the knowledge about semiconductor and P-N junction	The student can understand the semiconductor characteristics.
Special diodes Zener diode, Breakdown mechanism, I-V characteristics, LED, Photo diode, Varactor Diode, Tunnel Diode	To get the knowledge about Special diodes	The student can understand special diodes.
Bipolar Junction Transistor (BJT) BJT construction and operation, Transistor configurations, I/P and O/P characteristics of CE and CB configurations, Graphical determination of α and β , Graphical determination of h-parameters for CE configuration	To get the knowledge about the Bipolar junction transistor	The student can understand bipolar junction transistor .
Field Effect Transistor (FET) FET, Comparison between BJT and FET, Structure and operation of n-channel JFET, I-V characteristics, Parameters, Applications Depletion and Enhancement MOSFET, Structure and operation, I-V characteristics	To get the knowledge about the Field effect transistor	The student can understand the effect of transistor.
Power Devices Construction, working and characteristics of SCR, DIAC, TRIAC and UJT	To get the knowledge about the power devices	The student can understand the power devices

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem II	
COURSE NUMBER (PAPER NUMBER)	Paper: IV	
TITLE OF COURSE (NAME OF PAPER)	Digital Electronics	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Digital Logic Families Introduction to logic families, TTL NAND gate, Specifications of TTL logic family (Sinking, sourcing current, Input/output voltage limits, Fan-in, Fan-out, Noise margin, Propagation delay, Power dissipation)	To get the knowledge about logic families	The student can understand the logical families.
2. Combinational Logic Encoder: Decimal to BCD encoder, Priority encoder (IC 74147) Decoder: 2-4 and 3-8 decoders (IC 74138), BCD Decimal decoder, BCD-7 segment decoder (IC 7447). Multiplexer: 4-1 and 8-1 multiplexer (IC 74153) De multiplexer: 1-4 and 1-8 de-multiplexer	To get the knowledge about combinational logic encoder, decoder etc.	The student can understand the combinational logic.
3. Flip Flops RS flip flop using NOR gates, Clocked RS flip flop, D-flip flop, Edge triggered D-flip flop, JK-flip flop, Master slave JK flip flop, T flip flop.	To get the knowledge about flip-flops.	The student can identify the flip-flops
4. Shift Registers Shift register, Types of shift registers, SISO, SIPO, PISO and PIPO, Serial and parallel loading, Study of Right shift, Left shift, Ring counter, Johnson counter (IC 7495)	To get the knowledge about shift resistor	The students can understand the shift resistor.
5. Counter Techniques Basic counter operation, 4-bit asynchronous and synchronous counters, Combination counter, MOD-2, MOD-5 counter, Decade counter (IC 7490) (Timing diagrams are expected)	To study the asynchronous and synchronous counters.	Students can understand the asynchronous and synchronous counters.

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem V	
COURSE NUMBER (PAPER NUMBER) IX		
TITLE OF COURSE	Linear Integrated Circuits and Applications	
COURSE CONTENT	OBJECTIVES	OUTCOME
Fabrication of Integrated Circuits Advantages of IC's, Epitaxial process, Fabrication of monolithic components: npn and pnp, transistors, diodes, resistors and capacitors	To get the knowledge about the different processes and steps involved in the fabrication of ICs.	Students get the knowledge about the various steps involved in the fabrication of ICs.
Non linear Application of Op- amp Precision full wave rectifier, Active peak detector, Sample and hold circuit, Clipper and Clamper, Log and Antilog Amplifier	To get the knowledge about the different nonlinear applications of op amp.	Students get the knowledge about the different nonlinear applications of op amp.
Active Filters Introduction to filters Advantage of active filters over passive filters, Classification, Types of filters and their comparison, Second order Butterworth Low pass and High pass filters, Band pass, Band stop filters	To get the knowledge about the different types of filters, their classification and designing procedures	Students get the knowledge about the different types of filters, their classification and designing procedures
Regulated Power Supply Series Op-Amp regulator, Basic block diagram of IC regulator, Protection circuits for IC regulators Voltage regulators using IC78XX, 79XX, LM 317 and LM337. Designing of regulated power supply for 5Volt	To get the knowledge about the regulated power supplies, their designing and applications	Students get the knowledge about the regulated power supplies, their designing and applications
Phase Locked Loop VCO, Block diagram of PLL, Principle and working of PLL, Transfer characteristics, Derivation of lock range and capture range, Features of IC 565, Application of PLL as Frequency multiplier, FM demodulator, FSK demodulator using IC 565.V to F converter and F to V converter (LM 331)	To get the knowledge about the principle and working of PLL, their characteristics and applications	Students get the knowledge about the principle and working of PLL, their characteristics and applications

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem III	
COURSE NUMBER (PAPER NUMBER)	Paper: V	
TITLE OF COURSE (NAME OF PAPER)	Electronics Circuits	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Rectifiers, Filters and Regulators Diode rectifiers: Half wave, full wave and bridge rectifier, derivation of Ripple factor, Efficiency and PIV of full wave rectifier, Capacitor filter, Zener regulator	To get the knowledge about Rectifier, filter and Regulator	The student can understand Rectifier, filter and Regulator
2. Transistor Biasing Transistor biasing, DC load line, Operating point, Stability factor, Methods of transistor biasing: Fixed Bias, Emitter Bias, Voltage divider bias with mathematical treatment	To get the knowledge about transistor biasing	The student can understand
3. Transistor Amplifier Basic action of transistor amplifier, DC and AC analysis of CB, CE, CC configuration using, comparison of CB, CE, CC configuration, FET as CS amplifier Multistage Transistor Amplifier: RC Coupled, Transformer Coupled, Direct Coupled amplifier, Darlington pair amplifier Power Amplifiers: Class A, B, C amplifiers, circuit description distortion in power amplifiers, Class B push pull, complementary-symmetry amplifier	To get the knowledge about transistor amplifier	The student can understand the transistor amplifier
4. Feedback Amplifier Theory of feedback amplifier, Effect of negative feedback on Gain, Bandwidth, Distortion, Noise, Input impedance and Output impedance, Types of negative feedback, Analysis of current series feedback circuit	To get the knowledge about feedback amplifier	The student can understand feedback amplifier
5. Oscillators Barkhausen criterion, RC oscillators: Wien bridge, Phase shift, LC oscillators: Hartley oscillator, Colpitt's oscillator, Piezoelectric crystal and its equivalent circuit, Pierce Crystal oscillator	To get the knowledge about oscillator	The student can understand oscillator

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem III	
COURSE NUMBER (PAPER NUMBER)	Paper: VI	
TITLE OF COURSE (NAME OF PAPER)	Electronics Circuits	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Wave shaping Circuits Need of wave shaping circuit, linear wave shaping circuits: Differentiator and Integrator Non linear wave shaping: Diode Clipping and Clamping circuits.	To get the knowledge about wave shaping circuits eg. Differentiator, integrator etc.	The student can identify the wave shaping circuits
2. Time base Circuits General features of Time base signals, Concept of RC time base circuit, UJT as a relaxation oscillator, Linearity considerations, Miller integrator	To get the knowledge about time base signals.	The student can understand the time base signals
3. Multi-vibrators using BJT Transistor as a switch, switching characteristics, Types of multivibrator and applications. Astable multivibrator: Operation, Wave forms, Expression of output frequency. Monostable multivibrator: Operation, Triggering methods, Waveforms, Expression of gate width. Bistable Multivibrator: Operation, Triggering methods, Wave forms, Schmitt's Trigger: Operation, Hysteresis curve, Applications.	To get the knowledge about multivibrators eg. Asable, Bistable and Monostable multivibrators.	The student can understand the multivibrators eg. Asable, Bistable and Monostable multivibrators
4. Multi-vibrators using Gates A stable multivibrator using NAND gates, Monostable Multivibrator using NAND gates and IC74121.	To get the knowledge about multivibrators using the gates.	The student can understand multivibrators using the gates.
5. IC 555 Timer IC-555 timer- Pin configuration, functional block diagram, Astable multivibrator: Operation, wave forms, Expression for frequency and duty cycle, Monostable multivibrator: Operation, wave forms, Expression of gate width, Application of IC 555 as Sequential Timer, Battery charger, Voltage controlled Oscillator.	To get the knowledge about IC 555 as a timer.	The student can understand IC 555 as a timer.

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem I	
COURSE NUMBER (PAPER NUMBER)	Paper VII	
TITLE OF COURSE (NAME OF PAPER)	Operational Amplifier and Applications	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Differential Amplifier Need of differential amplifier, Emitter coupled differential amplifier, operation, Common mode gain and Differential mode gain, Derivation of CMRR, Constant current bias, Current mirror bias.	To get the knowledge about differential amplifier	The student can understand differential amplifier
2. Operational Amplifier Introduction, Block diagram, Equivalent circuit of op-amp, Ideal characteristics, open loop and closed loop configuration and its need, Op-amp parameters: Output offset voltage, Input offset voltage, Input bias current, Input offset current, Input impedance, Output impedance, CMRR, Slew rate, Maximum power bandwidth, PSRR, Specifications of IC 741	To get the knowledge about operational amplifier	The student can understand operational amplifier
3. Operational Amplifier Linear Systems Concept of virtual ground, Inverting amplifier, Non-inverting amplifier, Voltage follower, summing amplifier, Op-amp differential amplifier, Differentiator, Integrator, Current to Voltage converter and Voltage to Current converter	To get the knowledge about operational amplifier linear systems	The student can understand operational amplifier linear systems
4. Operational Amplifier Non-linear Systems, Basic comparator, Zero-crossing detector, Regenerative comparator, Precision rectifier	To get the knowledge about operational amplifier non-linear system	The student can understand operational amplifier non-linear system
5. Wave form Generators Oscillators - Phase shift oscillator, Wien Bridge oscillator, Saw tooth oscillator Astable multivibrator, Monostable multivibrator, Triangular wave generator	To get the knowledge about wave form generator	The student can understand wave form generator

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem III	
COURSE NUMBER (PAPER NUMBER)	Paper VIII	
TITLE OF COURSE (NAME OF PAPER)	Digital Techniques and Microprocessor	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Semiconductor Memories: Memory cell, Memory organization, memory parameters, Classification of memory volatile, non volatile, type of volatile and non volatile memory and their comparison, Concept of flash memory, study of memory chips: 2764, 6264	To get the knowledge about semiconductor memories	The students can understand semiconductor memories
2. Data Converters: Basic concepts of DAC and ADC, specifications, Digital to analog conversion: Binary weighted and R - 2 R ladder	To get the knowledge data converters	The students can understand data converters
3. Fundamentals of Microprocessor: Introduction to microprocessor, Basic system with Bus Architecture, The microprocessor Intel 8085: Salient Features, Block diagram, pin descriptions, Address/data bus, Data bus, control signals, ALU, Accumulator, Flags, Registers, Interrupts, Clock & reset circuit, concepts of T-state, Machine cycle, Instruction cycle.	To get the knowledge about fundamentals of microprocessor.	The students can understand fundamentals of microprocessor.
4. Programming with Microprocessor: The Instruction, Instruction set of 8085, Instruction format, Addressing modes, Classification instruction set, as per function, as per size, Algorithm, Flowchart, Assembly language programming of Data transfer Arithmetic operation logical operation ALP on Branch operation.	To get the knowledge about programming with microprocessor	The students can understand programming with microprocessor
5. Interfacing techniques: Concept of Tristate logic, Study of IC 74244, 74245, 74373, De-multiplexing of Address/data bus using 74373, Generation of control signal MEMR, MEMW, IOR, Need of Interfacing, Interfacing techniques, I/O mapped I/O and Memory mapped I/O mode, comparative study, Address decoding, Interfacing of memory chips 2764 and 6264 to the 8085 microprocessor	To get the knowledge about interfacing techniques of microprocessor	The students can understand interfacing techniques of microprocessor

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem V	
COURSE NUMBER (PAPER NUMBER) X		
TITLE OF COURSE	Fundamentals of Microcontroller	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Architecture of Microcontroller Comparison of Microprocessor and Microcontroller, Requirement of Microcontrollers, Overview and features of MCS 51 Family, Block Diagram and Pin description of 8051, Memory organization, GPRS, and SFRs, Flags, I/O Ports, study of Timer/Counter, study of Interrupts, study of Serial communication port, Clock and Reset circuit.	To get the knowledge about microcontroller	Students get the knowledge about the microcontroller
2. Instruction Set of 8051 Addressing Modes, Instruction Set, Execution of Instruction, Classification of Instruction Set - Data transfer group, Arithmetic group, Logical group, branch control group, Boolean/Single Bit Instructions, Concept of Stack and Subroutine.	To get the knowledge about instruction set of 8085	Students get the knowledge about the instruction set of 8085
3. Assembly Language Programming with 8051 Assembly Language Programming for Data Transfer, Arithmetic and Logical operations. Branching and Looping, I/O Port Programming and Bit manipulation, Time Delay Subroutine.	To get the knowledge about the	Students get the knowledge about the
4. Timer and Interrupt Programming in 8051 Configuration of timers as timers in various modes, Configuration of Timer as a Counter, Time delay generation, square wave generation. Programming of the interrupts: ALP for interrupt execution.	To get the knowledge about the Timer and Interrupt Programming in 8051	Students get the knowledge about the Timer and Interrupt Programming in 8051
5. Serial Port Programming in 8051 Basics of serial communication, Serial port of 8051, RS-232 standard and IC MAX-232, Baud rate in 8051, Baud rate doubling using crystal frequency and PCON register, SBUF, SCON registers, Importance of TI and RI flags, Assembly Language Programming for serial data transmission and reception.	To get the knowledge about the Serial Port Programming in 8051	Students get the knowledge about Serial Port Programming in 8051

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem V	
COURSE NUMBER (PAPER NUMBER)	XI	
TITLE OF COURSE	Sensors and Transducers	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Fundamentals of sensors and transducers The measure and, basic needs of measurements, Block diagram of measurement system, Characteristics of measurement Systems, static characteristics, dynamic characteristics and responses, Need of system calibration. Definition: Sensor and Transducer, Principle of transduction, Basic difference between sensor and transducer, Types of sensor, Static and Dynamic characteristics, Classification of transducers, Basic requirement of transducers, Selection criteria for transducer. Concept of Active and Passive Sensors.	To get the knowledge about fundamentals of sensors and transducers	Students get the knowledge about fundamentals of sensors and transducers
2. Resistive transducers Principle of operation, Potentiometer, Resistance pressure transducer, Resistive position transducer, Strain gauge, Temperature transducer: RTD, Thermistors.	To get the knowledge about the resistive transducers	Students get the knowledge about the resistive transducers
3. Inductive transducer Principle of operation, Variable reluctance type transducer, Differential transducer: Linear Variable Differential Transducer and Rotary Variable Differential Transducer	To get the knowledge about the inductive transducer	Students get the knowledge about the inductive transducer
4. Capacitive transducer Principle of operation, Variable Area Type, Variable Air Gap type, Variable Permittivity type, Capacitor microphone.	To get the knowledge about the capacitive transducer	Students get the knowledge about the capacitive transducer
5. Electronic Transducers and Actuators Transducers: Thermocouple, Piezoelectric transducer, Hall Effect transducers, Photo electric transducer: LDR, Photo-voltaic cell, Photo diode, Photo transistor. Pyrometers. Smart Sensors: Temperature sensor, LPG sensor, PIR sensor. Actuators: Electromagnetic Relay, Solenoid, Opto-couplers.	To get the knowledge about the electronic transducers and actuators	Students get the knowledge about electronic transducers and actuators

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem V	
COURSE NUMBER (PAPER NUMBER) XII		
TITLE OF COURSE (NAME OF PAPER) Power Electronics		
COURSE CONTENT	OBJECTIVES	OUTCOME
<p>1. Power Devices Power diode: Construction, switching characteristics and applications Effect of reverse and forward recovery time, Power BJT and MOSFET: Construction, switching characteristics and applications, IGBT and SIT: Construction, working, applications, Thermal considerations and heat sinks for power devices</p>	To get the knowledge about the BJT, MOSFET, IGBT and SIT	Students get the knowledge about the BJT, MOSFET, IGBT and SIT
<p>2. Thyristor SCR: operating principle with two transistor analogy, V-I characteristics, Latching Current (IL) and Holding Current (IH), advantages, disadvantages, and applications. GTO and PUT: Construction, working, V-I characteristics, and applications. Concept of turn on mechanism of SCR: Forward break-over triggering, dv/dt triggering, thermal triggering, illumination triggering, gate triggering. Triggering circuits: R, RC, UJT and PUT Concept of turn off mechanism of SCR, Turn OFF methods: Class A, Class B, Class C and Class D, Concept of di/dt, dv/dt and its protection circuits</p>	To get the knowledge about the thyristor	Students get the knowledge about the thyristor
<p>3. Controlled Rectifier Concept of Phase control, Single phase half wave controlled rectifier with resistive and inductive load, Effect of free-wheeling diode, Single phase full wave controlled rectifier with resistive load and inductive load, Three phase full wave controlled rectifier with resistive load</p>	To get the knowledge about the Controlled Rectifier	Students get the knowledge about the Controlled Rectifier
<p>4. Invertors and Choppers Classification of inverters, Transistor inverter, Series and Parallel Inverter using SCR, Basic principle of single phase half and full bridge inverter, Concept of Chopper Basic chopper circuit, Step down and step up chopper using SCR, Jones chopper</p>	To get the knowledge about Invertors and Choppers	Students get the knowledge about the Invertors and Choppers
<p>5. Applications of Power devices</p>	To get the knowledge	Students get the

Applications of SCR: Speed control of dc Motor, flasher circuit, battery charger circuit, emergency lighting system, block diagram and concept of UPS, block diagram and concept of SMPS.	about the Applications of Power devices	knowledge about applications of power devices
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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem V	
COURSE NUMBER (PAPER NUMBER)	XIV	
TITLE OF COURSE (NAME OF PAPER)	Embedded System Design	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Fundamentals of Embedded Systems design Definition of an embedded system, Basic architecture of embedded system, characteristics of embedded systems, Applications of embedded systems. Minimum 89s51 based hardware for general embedded system.	To get the knowledge about the fundamentals of embedded systems design	Students get the knowledge about the fundamentals of embedded systems design
2. Programming with the C: Introduction to C programming: Basic Structure of C program, character set, keywords and identifiers, constants and variables, concept of global declaration and local declaration, data types and data ranges, expressions and operators. Study of IO statements, Control Statements, Arrays, Loops, User`s defined functions. Simple examples.	To get the knowledge about the programming with the C	Students get the knowledge about the programming with the C
3. Fundamentals of Embedded C: Basic Structure of Embedded C program, Need of Operating System, Concept of Super loop. An embedded C programs for Generation of Time delay with and without use of timers, Square wave generation, Programming of I/O port and Serial Port, Interrupts.	To get the knowledge about the fundamentals of embedded C	Students get the knowledge about the fundamentals of embedded C
4. Interfacing of devices: The Hardware and Software Development of both Hardware and software for interfacing of Switches, Thumbwheel switch, Relays, LEDs, Transistor, Opto-coupler, Seven Segment Display, 16 X 2 LCD, Stepper Motor, ADC 0804/0809 and DAC 0808, DAC by using PWM technique.	To get the knowledge about the interfacing of devices: the hardware and software	Students get the knowledge about the the interfacing of devices: the hardware and software
5. Designing of an Embedded System Designing of microcontroller 89s51 based embedded system for Measurement of Temperature of an environment, Designing of microcontroller 89s51 based embedded system for Measurement of humidity of an environment, Designing of microcontroller 89s51 based embedded system for DC motor control using PWM technique	To get the knowledge about designing of an embedded system	Students get the knowledge about designing of an embedded system

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem VI	
COURSE NUMBER (PAPER NUMBER)	XV	
TITLE OF COURSE (NAME OF PAPER) Electronics Instrumentation		
COURSE CONTENT	OBJECTIVES	OUTCOME
<p>1. Fundamental of Signal Conditioning General block diagram for electronics instrument design for measurement. Minimum requirements, Block diagram of dc and ac signal conditioning techniques, Excitation, Grounding and electromagnetic and electrostatic shielding. Signal conditioners, Bridge amplifier, Pre-amplifiers, Instrumentation amplifier, Isolation amplifiers and chopper Amplifiers, Display unit.</p>	To get the knowledge about the fundamental of signal conditioning	Students get the knowledge about the fundamental of signal conditioning
<p>2. Programmable instrumentation amplifiers Need of Programmable instrumentation amplifier, Salient features of Programmable Instrumentation amplifiers. Salient features, Block diagram and Pin description of Instrumentation amplifiers AD620, Salient features, Block diagram and Pin description of Precision amplifiers AD594/595.</p>	To get the knowledge about the programmable instrumentation amplifiers	Students get the knowledge about the programmable instrumentation amplifiers
<p>3. Signal transformation and Data Acquisition System(DAS) Offset compensation, 4-20mA current transmission, Ratiometric and logarithmic conversion. Need of DAS, Single channel DAS, Multi-channel DAS, Data loggers: Basic Operation of data loggers, compact data loggers. Computer based DAS.</p>	To get the knowledge about the signal transformation and data acquisition system	Students get the knowledge about the signal transformation and data acquisition system
<p>4. Measuring Instruments and Display and Recording Devices Digital multimeter, Signal and Function generator, Analog CRO, Digital Storage Oscilloscope, LCR Q Meter X-Y Recorder, Magnetic recorder, Digital data recorder.</p>	To get the knowledge about the measuring instruments and display and recording devices	Students get the knowledge about the measuring instruments and display and recording devices
<p>5. Case Study Study of PH Meter, Conductivity meter and Temperature meter</p>	To get the knowledge about the case study PH meter, conductivity meter etc.	Students get the knowledge about the the case study PH meter

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NAME OF SUBJECT	Electronics	
SEM I / II / III / IV / V / VI	Sem VI	
COURSE NUMBER (PAPER NUMBER)	XVI	
TITLE OF COURSE (NAME OF PAPER)	Modern Communication Systems	
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Fiber Optic Communication Need of light wave communication, working principle of fiber optic cable, Definition and terminologies: bit rate, baud rate, bandwidth, channel capacity, power calculation Block diagram of Optical Fiber Communication System, Fiber optic cables, types, Splicer and Connectors. Sources and Detectors; Transmitter and receivers, Applications	To get the knowledge about the Fiber Optic Communication	Students get the knowledge about the Fiber Optic Communication
2. Satellite Communication Satellite Orbits, Satellite Communication System, Earth Station, and Transponders, Application of Satellite communication system	To get the knowledge about the satellite communication	Students get the knowledge about the satellite communication
3. Mobile communication Concept of cell, basic cellular system and its operational procedure, Hand off, power requirements, Block diagram Transmitter, receiver, Frequency synthesizer, logic unit, control unit.	To get the knowledge about the mobile communication	Students get the knowledge about the mobile communication
4. Microwave and Radar Communication Basics of microwave communication, advantages, Transmission lines, Waveguides and cavity resonators, Microwave semiconductor devices, microwave tubes. RADAR: Concept of radar, Pulsed Radar System.	To get the knowledge about the microwave and radar communication	Students get the knowledge about the microwave and radar communication
5. Computer Communication Digital Data Communications Concepts, Modems: Block diagrams of QPSK and QAM Protocols., Computer Networks: LAN, MAN, WAN. Network Topologies Concept of Internet, Bluetooth and Wi-Fi and their standards.	To get the knowledge about the computer communication	Students get the knowledge about the computer communication

Signature of HOD

