SHIVAJI UNIVERSITY, KOLHAPUR.

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Revised Syllabus For

B.C.S.

Part – I Electronics (Sem.-I & II)

Syllabus to be implemented from June -2013 onwards.

STRUCTURE OF COURSE
ELECTRONICS
Semester I

Sr.No	Paper	Name of Paper	Marks
1	Paper I	Electronics Devices and Circuits – I	50 (Theory)
2	Paper II	Digital Electronics- I	50 (Theory)

Semester II

Sr.No	Paper	Name of Paper	Marks
1	Paper III	Electronics Devices and Circuits II	50 (Theory)
2	Paper IV	Digital Electronics -II	50 (Theory)

Practical Annual

1	Practical I & II	Electronics Practical's I & II	100 Marks

Electronics Paper- I

Electronics Devices and Circuits – I

UNIT – I	Liner components in computer (12)
	Resistors : Classification, construction of carbon composition resistor only, color code, specifications of Resistors
	Capacitors : Classification, construction of electrolyte capacitor only, Specifications of capacitor
	Inductors : types of inductors, uses, types of transformers, construction of step down transformer and its Specifications
	Types of switches, construction and working of electro mechanical relay, Types of cables(Coaxial, twisted pair, optical fiber), comparison of cables.
UNIT : II	DC circuit analysis (06) Ohm's law, Kirchhoffs current and voltage law with examples, concept of current source,
	Voltage source(Ideal and practical) : application of Kirchhoff's laws
	Thevenin's Theorem, Norton's Theorem, Superposition Theorem Maximum power transfer theorem, (only statement and examples)
UNIT : III	Semiconductor Diode (06) Introduction to semiconductor, P-type & N-type semiconductors, P-N junction diode, Forward and reverse bias of PN junction diode, Zener diode and its parameters, photodiode and LED, Applications- opto-coupler, dot matrix display of LED, 7 segment display. Specifications of diodes (1N4007, 1N 4007)

UNIT : IV	Bipolar junction Transistor (08) Structure and working of bipolar junction transistor, Transistor configurations : CB, CC, CE, Input , output and transfer characteristics of transistor in CE mode only. Relation between α and β, DC & AC load line and Q point Transistor biasing ; Potential divider biasing only Application of transistors: Amplifier, switch, photo- switch circuit(using photo-diode, transistor, relay)

RECOMMANDED BOOKS :-

1	Principles of Electronics : A.P. MALVINO, Tata Mc-Graw Hill Publication, 7 Edition.
2	A text Book of Applied Electronics R.S. Shed, S chand Publication
3	Electronic Devices and circuits by S. Rama Reddy, Narosa publication Dheil ,
4	Principles of Electronics : V.K. Mehets, S.Chand & Company Ltd. 5 Edition
5	Basic Electronics and Linear Circuits : N.N. Bhargava, D.C. Kulshreshtha, S.C. Gupta Tata McGraw Hill Publishing company
6 7	Electronic Devices and ciruits : Boyistead, Tata Mc-Graw Hill

<div align="center">**Semester I Electronics Paper II**</div>

<div align="center">**Digital Electronics- I**</div>

UNIT 1: Number System AND Binary Codes (06)

Binary, Octal, Hexadecimal Number system,Inter conversion from one system to another, BCD code, Gray code, Exess-3 code, ASCII code, EBCDIC code, Concept of parity.

Signed and unsigned numbers, 1's complement and 2's complement of binary numbers, binary arithmetic.

UNIT 2: Logic Gates (06)

Logic gates-AND, OR, NOT, NOR, NAND, EX-OR (Symbol, Expression and Truth Table),De-Morgan's Theorems, Universal gates (NAND and NOR), Boolean algebra and identities
Simplifications of logic expressions using a) Boolean algebra, b) K-map, Introduction to logic families, TTL NAND gate, tri-state logic, input , output parameters, fan in, fan out, propagation delay,, power dissipation, noise margin.

UNIT 3: Combinational Circuits (10)

Half adder, Full adder, half subtractor, 4-bit Parallel adder, 4-bit adder/subtractor , Arithmetic logic unit, Encoder, Decoder, Multiplexer(4:1), De multiplxer(1:4), concept of analog multiplexer.

Pin Configuration of 74153, 74156,7447,74138

UNIT 4: Sequential circuits (10)

Concept of sequential circuits,
 Flip-flops: RS, Clocked RS, JK, Master Slave JK, D Flip-flop, Counter-synchronous, asynchronous, up-down counter, modulo-N counter,

Decade counter (IC 7490); shift register(IC 7495), ring counter, Johnson counter;

RECOMMANDED BOOKS:

1. Digital principals and applications; Malvino Leach, Tata McGraw Hill, 4th Edition
2. Fundamentals of Digital Electronics; A. Anand Kumar PHI Publications 2001
3. Digital Principles; T.L Floyd 3rd edition
4. Digital Electronics; C.F. Strahglo
5. Modern digital Electronics; R.P Jain, Tata Mc-Graw Hill Publication
6. Digital logic and computer design-Morris Mano
7. First course in Digital System Design; John P. Uyemura, Brooke/cole, Thompson Learning.

BCS Part I

Electronics Practicals –I

1. Positive & Negative Voltage regulators using 3 pin IC's
2. Verification of Krichhoff's Laws
3. Study of CRO
4. Transistors as switch (Application for LED & Relay)
5. Study of full wave rectifier with & without filter (calculation of ripple)
6. Study of basic gates
7. Universal building block
8. Verification of De-Morgans Theorems
9. Study of Flip-Flops (D & JK)
10. Half & full adder

Semester II

Electronics Paper III

Electronics Devices and Circuits II

UNIT 1: Field Effect Transistor (08)

Structure and working of: JFET, I-V characteristics and parameters (Pinch off voltage, trans conductance, drain resistance, amplification factor); MOSFET (construction and application only)

Applications: FET as Voltage Variable resistance (VVR), inverter, switch, memory cell, DRAM

UNIT 2: Amplifier and Oscillators (06)

Classification of amplifiers: Single stage amplifier, Idea of multi-stage amplifier.
Coupling Schemes (Direct coupling, RC coupling, Transformer coupling), any one audio amplifier circuit using IC, Explanation of microphone and speaker

Concept of positive and negative feedback.

Barkhausen criteria; Hartley oscillator; Colpitts oscillator, Crystal Oscillator (Only working of circuits and equation for output frequency), Applications of oscillators in Transmitter and receiver.

UNIT 3: Operational Amplifiers (08)

Introduction to differential amplifier, Concept of operational amplifier (block diagram); ideal characteristics of Op-amp;

Op amp as comparator; Virtual ground concept

Applications; Inverting amplifier, Unity gain inverting amplifier, Non-inverting amplifier, buffer, Adder, subtractor, integrator, differentiator, Phase shift oscillator using OP AMP.

UNIT 4 Power Supply (10)

Block diagram of regulated power supply, Construction and working od rectifier (Half, Full, Bridge); concept of ripple voltage; filter circuits;

concept of load and line regulation: Zener as regulator; 3-pin positive and negative voltage regulator;

SMPS, UPS: online and offline (block diagram);

RECOMMANDED BOOKS:

1. Principles of Electronics: A.P.MALVINO, Tata Mc-Graw Hill Publication, 7 Editions.
2. A text Book of Applide Electronics R.S.Sheda,   S. Chand Publication
3. Electronics Device and circuits by Rama Reddy, Narosa Publicaion Dheli
4. Principles of Electronics: V.K.Meheta, S. Chand & company Ltd. 5 Edition

5. Basic Electronics and Linear Circuits: N N Bhargava, D.C.Kulshreshtha, S.C.Gupta, Tata Mc-Graw Hill Publishing company
6. Electronics Devices and circuits; Boylstead, Tata Mc-Graw Hill
7. Operation Amplifiers By Ramakant Gaikwad.

UNIT 1: Multivibrator (06)

Types of multivibrator, block diagram of IC 555; Application of IC 555 as Astable, and Monostable (Calculation of frequency and Pulse width) Crystal clock using inverter. Clock circuit using NAND gate

UNIT 2: Memory devices and memory Organization (10)

Types of Memory – volatile and nonvolatile, SRAM and DRAM, Classification and Working principle of memory devices; RAM, ROM, PROM, EPROM, and EEPROM, UVEPROM, Flash RAM;

Concept of Diode Matrix ROM, speed and cost range of memory devices, Memory organization - building the required memory size by using available memory chips, memory address map

UNIT 3 Introductions to Microprocessor (08)

Introduction, Types (8, 16, 32 Bits), Pin Diagram and Architecture of 8085, Pin Diagram and Architecture of 8086,

UNIT 4 Programming of process (08)

Instruction Set of 8085, Addressing modes of 8085, ALP Programs for Data transfer, Additions, Subtraction, Multiplication, Division, Block Transfer, Block Exchange.

RECOMMANDED BOOKS:

1. Digital principals and applications; Malvino Leach, Tata McGraw Hill, 4th Edition
2. Fundamentals of Digital Electronics: A. Anand Kumar PHI Publication 2001
3. Digital principals: T.L. Floyd 3rd edition
4. Digital Electronics: C.F. Strangio
5. Modern digital Electronics: R.P. Jain, Tata McGraw Hill Publication
6. Digital logic and computer design – Morris Mano
7. First course in Digital System Design: John P. Uyemura, Brooke/Cole, Thompson Learning (2001)
8. 8085 Microprocessor by R.S.Gaonkar
9. 8085 Microprocessor BY B.Ram

Electronics Paper III

Electronics Practicals –II

1. Phase shift oscillator using 741
2. Adder & substractor using 741
3. Temperature controller using LM 35 and 741
4. IC audio amplifier and optical fiber link.
5. Characteristics of JFFT calculation of parameters
6. Study of crystal oscillator using transistor and gate
7. IC 555 as astable, Monostable, Multivibrator
8. Study of Shift Register
9. Multiplexer & Demultiplexer using IC's
10. Arithmetic operations using 8085 up kit or simulator
11. Block transfer using 8085 kit or simulator.

EQIVALENCE IN ACCORDANCE WITH TITLES AND CONTENTS
OF PAPERS(FOR REVISED SYLLABUS)

Sr.N0	Title of Old Paper	Title of new paper
1	Sem-I Electronics Paper I Electronic Devices and Circuits I	Sem-I Electronics Paper I Electronic Devices and Circuits I
2	Sem-II Electronics Paper III Electronics Devices and Circuits II	Sem-II Electronics Paper III Electronics Devices and Circuits II
3	Sem-I Electronics Paper II Digital Electronics Sem-II Electronics Paper IV Digital Electronics II	Sem-I Electronics Paper II Digital Electronics Sem-II Electronics Paper IV Digital Electronics II
	Practical	Practical I & II