"Education for Knowledge, Science and Culture"
-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR

B.Sc.-II ELECTRONICS

Semester- III & IV

CBCS Syllabus to be implemented from June 2022 onwards

VIVEKANAND COLLEGE ESTD. JUNE 1964

B.Sc. II (Electronics), Semester: III
Paper-V: DSC-1005 C1: Electronic Communication

Theory: 36 Hours (45 lectures of 48 minutes) -Credits -2 (Marks-50)

Course Outcomes: After the completion of the course the student should be able to -

CO1: Identify the basic concepts of electronic communication

CO2: Identity different Modulation & Demodulation schemes for analog communications (AM, FM, PM)

CO3: Illustrate the various analog Pulse Modulation techniques

CO4: Identify the principals of Digital Modulation & Data Communication techniques

Unit	Contents	Hours
1	**Electronic communication:** Introduction to communication – means and modes, Block diagram of an electronic communication system, Electromagnetic communication spectrum, band designations and usage, Concepts of bandwidth, gain, attenuation, Channels and base-band signals, Concept of Noise, signal-to-noise (S/N) ratio	10
2	**Analog Modulation-Demodulation:** Introduction to modulation, Need for modulation, Amplitude Modulation (AM), Mathematical expression, modulation index, frequency spectrum and AM power, Classification of AM, Concept of DSB, SSB generation, Amplitude Demodulation (diode detector), Phase Modulation (PM)(concept only), Frequency Modulation (FM), modulation index and frequency spectrum, equivalence between FM and AM, Generation of FM using VCO, FM detector (Slope detector), Block diagram and working of FM Super heterodyne radio receiver	10
3	**Analog Pulse Modulation:** Channel capacity, Sampling theorem, Basic Principles- Pulse Amplitude Modulation (PAM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), Modulation and detection technique for PAM	8
4	**Digital Pulse Modulation:** Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Phase Shift Keying (BPSK and QPSK)	8

Reference Books:

- Electronic Communications, D. Roddy and J. Coolen, 4th Edition Pearson Education India.
- Electronic Communication systems, G. Kennedy, 3rd Edition, 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
- Electronic Communication Systems: Fundamentals through Advanced, W. Tomasi, Pearson Education, 3rd Edition.
- Wireless communications, Andrea Goldsmith, 2015, Cambridge UniversityPress

B.Sc. II (Electronics), Semester: III
Paper- VI: DSC-1005C2: Microprocessor 8085

Theory: 36 Hours (45 lectures of 48 minutes) -Credits -2 (Marks-50)

Course Outcomes: After the completion of the course the student should be able to -

CO1: Identify various components of Microcomputer system.

CO2: Identify Architecture of 8085 microprocessor.

CO3: Familiar with instructions set and addressing modes of 8085 microprocessor.

CO4: Write assembly Language programs for 8085 microprocessor.

Unit	Contents	Hours
1	**Microcomputer Organization**: Basic components of microcomputer (CPU, Program memory, Data memory, input and output ports), idea of RAM (SDRAM, DRAM), Types of ROM, Memory Organization & addressing: Memory Interfacing, Memory Map.	08
2	**Architecture of 8085 Microprocessor:** Salient features of 8085, Block diagram and Pin description of 8085, Data and address bus, Registers, ALU, Stack pointer, Program counter, Flag register, Clock and reset circuits, Interrupts in 8085, Demultiplexing of AD0-AD7,T-states, Machine cycle, Instruction cycle, Timing diagram of MOV and MVI instructions	10
3	**Instruction Set of 8085 Microprocessor:** Instruction format, Addressing modes of Instructions, classification of Instruction Set: Data transfer (including stacks), Arithmetic, logical, branch and control instructions.	8
4	**Programming with 8085 Microprocessor:** Programs for Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking of a number, arrange the numbers in ascending and descending order, to find odd and even numbers, to find parity of given number, Time delay generation using single register and register pair.	10

Reference Books:

- Microprocessor Architecture Programming & applications with 8085 by R. S. Goankar, 4th edition Prentice Hall.
- Microprocessors and Interfacing by Douglas V Hall, 2nd edition, Tata McGraw-Hill (2005)
- Microprocessor 8085 by V.S. Kore, Mahalakshmi Publications
- Fundamental of Microprocessor and Microcomputers –by B. Ram, 5th edition, Danpat Rai Publications.

B.Sc. II (Electronics), Semester: IV
Paper- VII: DSC -1005D1: Operational Amplifier

Theory: 36 Hours (45 lectures of 48 minutes) -Credits -2 (Marks-50)

Course Outcomes: After the completion of the course the student should be able to -

CO1: Discuss the op-amps basic construction, characteristics, parameters, various configurations

CO2: Design various linear and non-linear circuits using op-amp

CO3: Design various waveform generators

CO4: Design comparators and rectifiers using Op-amp.

Unit	Contents	Hours
1	**Introduction to Operational Amplifier:** Transistor dc amplifier, Emitter coupled Differential amplifier, parameters of Differential amplifier (Ad, Ac, and CMRR), and configurations of differential amplifier. Introduction to op-amp, block diagram of op-amp, electrical parameters of op-amp, offset balancing technique of op-amp, study of IC 741.	12
2	**Applications of Op-amp:** Virtual ground concept, **Linear Applications:** Op-amp as inverting and non-inverting amplifier, Voltage follower, Op-amp as adder and Subtractor, **Non-Linear Applications:** Differentiator and Integrator.	9
3	**Oscillators:** Phase shift oscillator, Wien –bridge oscillator, Triangular wave generator, Square wave generator, Saw tooth wave generator	7
4	**Comparators and Rectifiers** Basic comparator, Zero crossing detector, Regenerative comparator (Schmitt trigger),Peak detector, Clippers (positive and negative) and Clampers (positive and negative) Precision rectifiers: Op-amp as precision rectifiers(half wave and full wave)	8

Reference Books:

- Op-Amps and Linear Integrated Circuits – Ramakant Gaikwad, 3rd edition (PHI)(1994)
- Integrated Electronics – J. Millman and C.C. Halkias, 2nd edition (Tata McGraw-Hill)(2012)
- Op-Amps and Linear Integrated Circuits –Coughlin, Driscoll(PHI) 6th edition(2001)
- Linear Integrated circuit - D Roy Choudhari, Shail Jain, 5th edition,(New Age International Publication

B.Sc. II (Electronics), Semester: IV
Paper- VIII: DSC-1005D2: Microcontroller 8051

Theory: 36 Hours (45 lectures of 48 minutes) -Credits -2 (Marks-50)

Course Outcomes: After the completion of the course the student should be able to –

CO1: Identify the building blocks of 8051 microcontroller

CO2: write assembly program for 8051 microcontroller

CO3: Demonstrate Timer & Counter programming with 8051 microcontroller

CO4: Demonstrate serial & Interrupt programming with 8051 microcontroller

Unit	Contents	Hours
1	**Introduction to 8051 Microcontroller:** Comparison between microprocessor and microcontroller, Salient features of 8051family, Block diagram of 8051, Pin description of 8051 microcontroller, RAM structure of 8051, SFR's and GPR's in 8051, PSW register ,Clock and Reset circuits, I/O Ports	8
2	**Instruction Set of 8051:** Classification of instruction sets, Addressing modes. Instruction set of 8051: Data transfer, Arithmetic, Logical, Jump, Call, Boolean instructions.	10
3	**8051Timer Programming :** Introduction to Timers, Timer Registers, Timer modes and Timer Programming using mode 1 and mode 2:- Square wave generation, rectangular wave generation Counter Programming: pulse counter	8
4	**8051 Serial and Interrupt Programming:** **Serial ports**: Serial port of 8051, modes, Serial port Registers, Serial port programming. **Interrupt**: Interrupt in 8051, Interrupt registers, Programming with interrupt	10

Reference Books:

- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd edition., 2007, Pearson Education India.
- Microcontrollers (Theory and Applications), Ajay V. Deshmukh, Tata McGraw Hill..
- The 8051 Microconroller, Kenneth Ayala, 3rd edition, CENGAGE Learning.

ELECTRONINCS LAB: DSC -1005C and 1005D (Practical) Credits: 08 Marks: 100

(Note: Minimum 08 experiments has to perform from each group)

Group A

1. To study Amplitude Modulator and demodulator
2. To study FM modulator
3. To study Pulse Amplitude Modulation (PAM)
4. To study Pulse Width Modulation (PWM)
5. To study ASK Modulator
6. To study PSK Modulator
7. To study FSK Modulator
8. To study PCM
9. To study PPM
10. Study of Tuned Amplifier

Group B

1. To design Op-Amp as Inverting and Non-Inverting amplifier
2. To study Op-Amp as adder and Subtractor
3. To study Op-Amp as integrator and differentiator
4. To study Op-Amp as Schmitt trigger.
5. To study Op-Amp as comparator (Zero reference and non-zero reference)
6. To design phase shift oscillator using Op-Amp.
7. To design Wein bridge oscillator using Op-Amp
8. To study Op-Amp as triangular wave generator
9. To study Op-Amp as Square wave generator
10. To study Op-Amp as precision rectifier.
11. To study Op-Amp as peak detector

Group C

1. Addition of Two 8 Bit Numbers using 8085
2. Subtraction of Two 8 Bit Numbers using 8085
3. Multiplication of Two 8 Bit Numbers using 8085
4. Division of Two 8 Bit Numbers using 8085
5. Program to transfer the memory block using 8085
6. Program to exchange the memory blocks using 8085
7. To arrange the given number in ascending and descending order using 8085
8. Programs to find even and odd numbers using 8085
9. To find total number of even and odd numbers in an array using 8085
10. Programs for masking and to find parity of given number using 8085

Group D

1. Arithmetic instruction programming using 8051
2. Logical instruction programming using 8051
3. Boolean/Bit manipulation instruction programming using 8051
4. Code conversion using 8051
5. Study of timers of 8051 in mode 1
6. Study of timers of 8051 in mode 2
7. Study of counters of 8051
8. Study of Serial programming of 8051
9. Study of Timer Interrupts programming of 8051
10. Study of Serial communication Interrupts programming of 8051
11. Study of External hardware Interrupts programming of 8051

Marks Distribution of Practical (LAB):

Group	A	B	C	D	Journal	Industrial visit	Seminar/ Project
Marks	20	20	20	20	08	04	08

B.Sc. II (Electronics), Semester: III

Skill Enhancement Course (SEC-1)

Electronic Circuit design and Simulation using Proteus

36 Hours (45 lectures of 48 minutes) -Credits -2

Course Outcomes: After the completion of the course the student should be able to -

CO1: Familiar with Proteus Simulation software

CO2: Design circuit schematics

CO3: Simulate and analyze Analog circuits

CO4: Simulate and analyze Digital circuits

Unit-1: Introduction to circuit simulation software **(12)**

Introduction to Proteus, Features of Proteus, Proteus Layout - Editing Window, Overview window, object selector, zoom option, Tool Option, Run Buttons

Unit-2: Schematic Design **(12)**

Beginning a New Schematic, Placing components in the Schematic, Labeling components, wiring components, editing the Schematic, Checking the Schematic for Errors

Unit-3: Circuit Simulation **(12)**

Simulation of different types of Analog and Digital circuits, Simulation of microcontroller circuits.

Reference Books:

1. User manuals of PROTEUS

B.Sc. II (Electronics), Semester: IV

Skill Enhancement Course (SEC-2)

PCB (Printed circuit board) Designing and fabrication

36 Hours (45 lectures of 48 minutes) -Credits -2

Course Outcomes: After the completion of the course the student should be able to -

CO1: Understand fundamentals of PCB

CO2: Create and design PCB

CO3: Develop PCB

CO4: Etch the PCB and assemble the circuit

Unit-1: Introduction **(6)**

Introduction to PCB, need and evolution of PCBs. Types of PCBs : Single and Multilayer, Technology: Plated Through Hole, Surface Mount, PCB Material, Electronic Component packaging, PCB Designing, Fabrication, Production, Electronic Design Automation Tools: Proprietary tools like Proteus, Eagle, Ultiboard, Orcad and Open source tools like KiCad, Design Issues: Transmission line, Cross talk and Thermal management.

Unit 2: PCB Design using Proteus **(10)**

Creating the Schematic: Placing Components, Moving, Deleting and Searching for Components, Connecting Components, Changing Component Names, Values, and Packages

Preparing the Schematic for Board Layout: Board Basics, Component Placement, Routing Traces, Adjusting Components and Changing Outline Size, Finalizing the Board Exporting Drills, Footprints and Libraries, Adding and Editing Pins.

Board Files: Generating the Drill and Gerber Files for Manufacturing

Unit 3: PCB Etching and Soldering **(8)**

Introduction, Etching machine, plating techniques, etching techniques, Principles of Solder Connection, Solder joints, Solder alloys, Soldering fluxes. Soldering, Disordering tools and Techniques, Mechanical Machining operations, Lead cutting and Soldering Techniques, Testing and quality controls.

Practicals: Fabrication of Circuits **(12)**

1. Design and fabricate Regulated Power Supply using IC 7805
2. Design and fabricate Dual Power Supply using IC 7809 and IC 7909
3. Design and fabricate Variable Power Supply using LM 317

Reference Books:

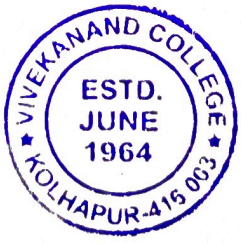
1. Printed circuit Board – Design & Technology by Walter C. Bosshart, TMH(1983)
2. Printed Circuit Board –Design, Fabrication, Assembly & Testing, R.S. Khandpur, TMH,3rd Edition(2017)

Evaluation Pattern:

Semester	Course codes	End Semester Examination Marks	CIE/Internal assessment Marks and Pattern	Practical Examination Marks	Total Marks
III	DSC-1005 C1	35	15 (Test)	-	50
	DSC-1005 C2	35	15 (Test)	-	50
IV	DSC-1005 D1	35	15 (Test)		50
	DSC-1005 D2	35	15 (Test)		50
	DSC-1005 C and DSC-1005 D			100 (Annually)	100

Marks Distribution of Practical (LAB) course: Total Marks: 100

Exam. types	Experiment Groups				Journal assessment	Industrial Visit/Study Tour	Seminar/ Project
	A	B	C	D			
Max. Marks	20	20	20	20	08	04	08



Nature of Question Paper:

Seat No.		Ques. paper code	

VIVEKANAND COLLEGE, KOLHAPUR
(AUTONOMOUS)

B.Sc. Part- II (Electronics) (Semester-III) Examination.....

Course Code and Name: DSC-1005 C1: Electronic Communication

Day: Time: 2 hours

Date: --/--/---- Marks : 35

Instructions:

1) All the questions are compulsory.

2) Figures to the right indicate full marks.

3) Draw neat labeled diagrams wherever necessary.

4) Use of log table/calculator is allowed.

Q. 1. A] Select correct alternative (One mark each): **[5]**

i) Xyzabcdefghijklmnop ----------

a) -------- b) -------- c) -------- d) --------

ii) Xyzabcdefghijklmnop ----------

a) -------- b) -------- c) -------- d) --------

iii) Xyzabcdefghijklmnop ----------

a) -------- b) -------- c) -------- d) --------

iv) Xyzabcdefghijklmnop ----------

a) -------- b) -------- c) -------- d) --------

v) Xyzabcdefghijklmnop ----------

a) -------- b) -------- c) -------- d) --------

Q. 1. B] Fill in the blanks (One mark each): **[2]**

i) Xyzabcdefghijklmnop ----------

ii) Xyzabcdefghijklmnop ----------

Q.2. Attempt any TWO (Eight marks each): **[16]**

i) Xyzabcdefghijklmnop.

ii) Xyzabcdefghijklmnop.

iii) Xyzabcdefghijklmnop.

Q.3. Attempt any THREE (Four marks each): **[12]**

i) Xyzabcdefghijklmnop.

ii) Xyzabcdefghijklmnop.

iii) Xyzabcdefghijklmnop.

iv) Xyzabcdefghijklmnop.

v) Xyzabcdefghijklmnop.

VIVEKANAND COLLEGE ESTD. JUNE 1964 KOLHAPUR-416 003