



**VIVEKANAND COLLEGE (AUTONOMOUS), KOLHAPUR**

**B.Sc.-II ELECTRONICS**

**Semester-III & IV**

**CBCS Syllabus to be implemented from June 2019 Onwards.**



**Section I: Electronics Communication**

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

- CO1:** Understanding of principles and technologies related to electronic communication systems.
- CO2:** Understand the principles of analog modulation techniques, such as AM and FM, and learn to demodulate signals.
- CO3:** Understand the impact of modulation parameters (e.g., modulation index, deviation) on signal characteristics.
- CO4:** Understand the principles of satellite communication, including orbit types, transponders, and satellite system design.

Unit	Contents	Hours Allotted
1	<b>Electronic Communication:</b> Introduction to communication- meaning and types, Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base band signals, concept of Noise, signal-to-noise (S/N) ratio.	12
2	<b>Analog Modulation-Demodulation:</b> Need for modulation, Amplitude Modulation (AM) modulation index and frequency spectrum. Generation of AM (using Transistor), 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), and Study of Super heterodyne radio receiver.	12
3.	<b>Satellite communication:</b> Introduction, Need, Geosynchronous satellite orbits, geostationary satellite, advantages of geostationary satellite. Satellite visibility, transponders (C-Band), path loss, ground station, simplified block diagram of earth station. Uplink and down link.	12

**Reference Books:**

- Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
- Electronic Communication systems, G. Kennedy, 3<sup>rd</sup> edition, 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3<sup>rd</sup> edition, McGraw Hill
- Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press



## Section II: Microprocessor 8085

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

**CO1:** Fundamental principles of microcomputer organization, including CPU architecture, memory systems, input/output interfaces, and bus structures.

**CO2:** Identify Architecture and operation of the 8085 microprocessor

**CO3:** Demonstrate a comprehensive understanding of the various instructions in the 8085 microprocessor instruction set.

**CO4:** Proficient in writing 8085 assembly language programs to solve a variety of computational problems.

Unit	Contents	Hours Allotted
1	<b>Microcomputer Organization:</b> 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	<b>Architecture of 8085 Microprocessor:</b> Silent 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.	<b>Instruction Set of 8085 Microprocessor :</b> Instruction set, classification of Instruction Set, Instruction format, Addressing modes of Instructions, Instruction set: Data transfer (including stacks), Arithmetic, logical, branch and control instructions).	8
4	<b>Programming with 8085 Microprocessor:</b> Programs of Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking, ascending and descending order, Time delay generation using register and register pair, Detection of odd and even numbers.	10

### Reference Books:

- Microprocessor Architecture Programming & applications with 8085, 2002, R.S.Goankar, Prentice Hall.
- Microprocessors and Interfacing By Douglas V Hall, McGraw Hill (2005)
- Microprocessor 8085 By V.S. Kore Mahalakshmi Publications
- Fundamental of Microprocessor and Microcomputers By B. Ram



# ELECTRONICS-DSC -1005 D

## Semester: IV Electronics-Paper- IV

### Advance Communication and Microcontroller 8051

Theory: 72 Hours (96 lectures of 48 minutes) - Credits -4 (Marks-100)

#### Section I: Advance Communication

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

**CO1:** Understanding of analog pulse modulation techniques such as Pulse Amplitude Modulation, Pulse Width Modulation, and Pulse Position Modulation.

**CO2:** Identify the Principals of Digital Modulation and Data Communication techniques

**CO3:** Understanding of the architecture, components, and operation of mobile telephony systems, including both cellular networks and mobile devices.

**CO4:** Understand the mobile communication protocols and wireless technologies.

Unit	Contents	Hours Allotted
1	<b>Analog Pulse Modulation:</b> Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only,	12
2	<b>Digital Pulse Modulation:</b> 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).	12
3.	<b>Mobile Telephony System</b> – Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, Hand-off process, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only). GPS navigation system (qualitative idea only)	12

#### Reference Books:

- Modern Digital and Analog Communication Systems, B.P. Lathi, 4<sup>th</sup> Edition, 2011, Oxford University Press.
- Electronic Communication systems, G. Kennedy, 3<sup>rd</sup> Edn., 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
- Communication Systems, S. Haykin, 2006, Wiley India



## Section II: Microcontroller 8051

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

**CO1:** Identify the building blocks of 8051 microcontroller.

**CO2:** Write assembly language program for 8051 microcontroller.

**CO3:** Demonstrate Timer, Counter & Serial Port Programming with 8051 microcontroller.

**CO4:** Develop the skills to interface and communicate with external devices.

Unit	Contents	Hours Allotted
1	<b>Introduction to 8051 microcontroller:</b> Comparison between microprocessor and microcontroller. Silent feature of 8051 family, , 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 circuit, Memory organization ,I/O Ports.	08
2	<b>instruction Set of 8051:</b> Classification of instruction sets, Addressing modes . Instruction set of 8051: data transfer, arithmetic, Logical, Jump, call, Boolean instructions.	10
3	<b>Timers, Serial port and Interrupts(Assembly)programming of 8051:</b> <b>A. Timer:</b> Timers in 8051, Timer Registers, modes and Programming of timers <b>B. Serial ports:</b> Serial port of 8051, modes, Registers Serial port, Serial port programming. <b>C. Interrupt:</b> Interrupt in 8051, Interrupt registers, Programming with interrupt.	08
4	<b>Interfacing of Devices with 8051:</b> Introduction to embedded C, comparison of C and assembly, Data types in C, SFR accessing , I/O programming, logical operations in C. C language programming: Program to generate square wave on port pin, Interfacing of LED , Opto-coupler, Switch, Relay, DC motor and Stepper motor.	10

### Reference Books:

- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2<sup>nd</sup> Ed., 2007, Pearson Education India.
- Microcontroller 8051 by Ajay Deshmukh.
- The 8051 Microcontroller by Kenneth Ayala



## **Group A**

At least 03 and 05 experiments respectively from following using hardware and simulations (minimum 08).

1. To design an Amplitude Modulator using Transistor/ Op-amp
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator / Detector circuit
4. To study AM Transmitter / Receiver
5. To study FM Transmitter /Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK modulator
- 11 To study PSK modulator
- 12 To study FSK modulator

## **Group B**

***Programs using 8085 Microprocessor (minimum 06)***

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Addition of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).



### **Group C**

*Experiments using 8051 microcontroller (minimum 06):*

1. Arithmetic operation using 8051
2. Logical operations using 8051.
3. Study of timers of 8051 in mode 1 and mode 2.
4. Study of interfacing of LED to 8051 microcontroller.
5. Study of interfacing of LED array.
6. Study of rotate instruction.
7. Study of interfacing of 7-segment display.
8. Study of interfacing multiplexed 7-segment display.
9. Study of interfacing of stepper motor.
10. Study of interfacing of D.C motor.

### **Group D**

#### **(Skill Enhancement Course)**

*Skill Enhancement Experiments (minimum 06):*

1. Designing of Printed circuit board (PCB) using Software
2. Development of Printed circuit board (PCB)
3. Soldering techniques: Assemble electronic circuit
4. Temperature Controller using IC 741 /Microcontroller8051.
5. Designing of Variable Power Supply using LM 317.
6. Build Regulated Power Supply using IC 7805
7. Build Dual Power Supply using IC 7809 and IC 7909
8. Assemble Electric Board with switches, sockets and Miniature circuit Breaker(MCB) and measure Voltage, Current and Power for given device
9. Study and fault finding of: Fan /Iron/ Mixer/Cell phone Charger
10. Build Lighting system using LED, Solar Panel and Chargeable Battery

**Marks Distribution of Practical (LAB):**

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



# Nature of Question Paper

Vivekanand College, Kolhapur (Autonomous)

B.Sc. Part – II Electronics Semester III Examination \_\_\_\_\_

Course Code and Name: DSC 1005C1: Electronic Communication

Day:

Time:

Date:

Total Marks: 40

- Instructions: 1) All the questions are compulsory.  
2). Figures to the right indicate full marks.  
3) Draw neat labeled diagrams wherever necessary.

## Section-I

Q.1) Select correct Alternatives from the following

(08)

i) -----

- a)                  b)                  c)                  d)

ii) -----

- a)                  b)                  c)                  d)

iii) -----

- a)                  b)                  c)                  d)

iv) -----

- a)                  b)                  c)                  d)

v) -----

- a)                  b)                  c)                  d)

vi) -----

- a)                  b)                  c)                  d)

vii) -----

- a)                  b)                  c)                  d)

viii) -----

- a)                  b)                  c)                  d)

Q.2) Attempt Any Two

(16)

i) -----

ii) -----

iii) -----





- i) -----
- ii) -----
- iii) -----
- iv) -----
- v) -----
- vi) -----

**Evaluation Pattern:**

Sem ester	Course Codes	End Semester Examination Marks	CIE/Internal assessment Marks and Pattern	Practical Examination Marks	Total Marks
III	DSC-1005C1	40	10 (Test)		50
	DSC-1005C2	40	10 (Test)		50
IV	DSC-1005D1	40	10 (Test)		50
	DSC-1005D2	40	10 (Test)		50
	DSC-1005C and DSC-1005D			100 (Annually)	100

**Mark Distribution of Practical (LAB) Course: Total Marks 100**

Exam types	Experimental Groups				Journal assessment	Industrial Visit/Study Tour	Seminar	Total Marks
	A	B	C	D				
Maximum Marks	20	20	20	20	08	04	08	100

