Name of the Department: Electronics
Semester- VI

DSC 7: Television and Digital Communication System

Course Title: Television and Digital Communication System	**Course code:** 21BSC6C13ELL
Total Contact Hours: 60	**Course Credits: 04**
Internal Assessment Marks: 40 marks	**Duration of SEE: 02 hours**
Semester End Examination Marks: 60 marks	

Course Outcomes (CO's): After the successful completion of the course, the student will be able to:

- Describe the basic principles transmission and reception of monochrome and color TV and its various circuitary.
- Explore the knowledge of satellite and mobile communication and its applications.
- Advancement in the communication systems like digital signal processing and transmission techniques.
- Will understand basic principles of optical communication systems and applications.

DSC 7: Television and Digital Communication System

Unit	Description	Hours
1	**Module 1: Basic television principles** 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.	**12**
2	**Module 2: Colour television** 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	**12**
3	**Module 3: Satellite communication** 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.	**12**
4	**Module 4: Digital communication** 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	**12**

	of PCM system, delta modulation, digital carrier systems, Block diagram &function of ASK, FSK, PSK, QPSK &DPSK	
5	**Module 5: Optic fibers & communication** 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.	**12**

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

Name of the Department: Electronics
Semester- VI

DSC 7: Television and Digital Communication System Lab

Course Title: Television and Digital Communication System Lab	**Course code:** 21BSC6C14 ELP
Total Contact Hours: 56	**Course Credits: 02**
Internal Assessment Marks: 25 marks	**Duration of SEE: 03 hours**
Semester End Examination Marks: 25 marks	

Course Outcomes (CO's): After the successful completion of the course, the student will be able to:

- Observe circuit connections and their Behaviour.
- Study of various pulse modulation techniques and their hands-on response.
- Study of various Temperature Transducer and their response.
- Study of various TV circuits and digital communications

Lab experiments:

1. Photo transistor characteristics.
2. Study of different optical fibers
3. Demonstration of TV transmitters using ICT
4. Four-bit binary adder using IC7483
5. Study of PAM,
6. Study of PWM.
7. Study of PPM.,
8. Study of ASK
9. Study of FSK,
10. Study of PSK.

Note:

1. Minimum of EIGHT experiments must be carried out.
2. Experiments may be added as and when required with the approval of BoS.

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

Name of the Department: Electronics
Semester- VI

DSC 8: Instrumentation and Microcontrollers

Course Title: Instrumentation and Microcontrollers	**Course code:** 21BSC6C15ELL
Total Contact Hours: 60	**Course Credits: 04**
Internal Assessment Marks: 40 marks	**Duration of SEE: 02 hours**
Semester End Examination Marks: 60 marks	

Course Outcomes (CO's): After the successful completion of the course, the student will be able to:

- Describe the different sensors and their use-case in real time integrating on different circuits.
- Explore the knowledge of data Filtering, Amplification and its applications.
- Understanding the Assembly level programming with 8051 and performing the different programs and observe the outputs.
- Able to interface the various devices to 8051 microcontroller and study the impact and applications of the same by writing the programs.

DSC 8: Instrumentation and Microcontrollers

Unit	Description	Hours
1	**Module 1: Instrumentation-Sensors and applications** 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.	**12**
2	**Module 2: Signal Conditioners** 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.	**12**
3	**Module 3: 8051 Microcontroller** 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.	**12**
4	**Module 4: 8051 Addressing modes and Instruction set** I/O programming of 8051- I/O programming, bit manipulation, addressing modes, arithmetic, logical and single bit instructions and programming.	**12**

5	**Module 5: 8051 Timer/Counter Programming and Interfacing** 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.	**12**

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

Name of the Department: Electronics
Semester- VI

DSC 8: Instrumentation and Microcontroller Lab

Course Title: Instrumentation and Microcontroller Lab	**Course code:** 21BSC6C16ELP
Total Contact Hours: 56	**Course Credits: 02**
Internal Assessment Marks: 25 marks	**Duration of SEE: 03 hours**
Semester End Examination Marks: 25 marks	

Course Outcomes (CO's): After the successful completion of the course, the student will be able to:

- Observe circuit connections and their Behavior with programming.
- Study of various programs and their hands-on response.
- Study of various interfacing devices with 8051 and their response.
- Study of different IC's, sensors, filters, and amplifiers.

Lab experiments:

1`s and 2`s Complements of 8-bit numbers using 8051 microcontrollers.
2. Addition and Subtraction of two 8-bit numbers using 8051 microcontrollers.
3. Addition of two 16-bit numbers using 8051 microcontrollers.
4. Larger among two hexadecimal numbers using 8051 microcontrollers.
5. Smaller among two hexadecimal numbers using 8051 microcontrollers.
6. Seven segment LED Interfacing with Intel 8051 microcontroller through PPI.
7. Relay Interfacing with Intel 8051 microcontroller through PPI.
8. Stepper motor interfacing with 8051 microcontrollers through PPI.
9. Precision Full-wave Rectifier using OP-Amp.
10. Temperature Transducer and its response curve.

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