KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ

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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU/Aca(S&T)/SVB-04/BOS /Physics (UG) /20-21 3946 Date: 16 OCT 2020

NOTIFICATION

Sub: Regarding introduction of the syllabus of Electronics UG under C.B.C.S. w.e.f. the academic year 2020-21 & onwards.

Ref: 1. UGC Letter DO No. 1-1/2016(SECY), dt. 10.08.2016.
2. Special BOS Res. No. 05, dt. 29.07.2020.
3. Special Faculty Res. No. 12, dt. 11.08.2020.
4. Special Academic Council Res. No. 37, dt. 21.08.2020.
5. Vice-Chancellor's order dated -07-10-2020

Adverting to the above, it is hereby notified to the Principals of all constituent and affiliated degree colleges coming under the jurisdiction of Karnatak University, Dharwad that the Electronics UG syllabus for I to VI Semester which is annexed herewith in Annexure-A is introduced under C.B.C.S. from the academic year 2020-21 & onwards.

Hence, the contents of this notification may please be brought to the notice of the students and all the concerned. The prescribed C.B.C.S. syllabus may also be obtained through K.U.website (www.kud.ac.in).

15/10/2020
(Dr. Hanumantappa K.T)
REGISTRAR

To,

1. The Chairman, BOS Electronics (UG), Dept. of Electronics, K.U.Dharwad.
2. The Chairman, Dept. of Electronics, K.U.Dharwad.
3. The Principals of all the constituted and affiliated degree colleges under the jurisdiction of Karnatak University, Dharwad. (The same may be sent through e-mail)
4. The Registrar (Evaluation), K.U.Dharwad.

Copy fwcs to:

1. Dr. Ch.Ramesh, Dean, Faculty of Science & Tech., Dept. of Botany, K.U.Dharwad.
2. The Director, IT Section, Examination Section, K.U.Dharwad for information and to upload on K.U.Website (www.kud.ac.in).

Copy to:

1. PS to Vice-Chancellor, K.U.Dharwad.
2. S.A. to Registrar, K.U.Dharwad.
3. O.S., Exam UG / Confl / QP / GAD Section, K.U.Dharwad.
4. The System Analysist, Computer Unit Exam Section, K.U.Dharwad.

KARNATAK UNIVERSITY, DHARWAD

B.Sc. Programme

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DRAFT SYLLABUS FOR

ELECTRONICS (Optional)

Subject

AS DISCIPLINE SPECIFIC COURSE (DSC) , DISCIPLINE SPECIFIC ELECTIVE (DSE) and SKILL ENHANCEMENT COURSE (SEC)

UNDER

CHOICE BASED CREDIT SYSTEM (CBCS)

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Effective from 2020-21

Karnatak University, Dharwad

CBCS syllabus for Under Graduate Programme in Electronics (optional)

Effective from 2020-21

Semester	Theory/ Practical	Subject Code	Total Teaching hours perweek	Total Teaching hours per Semester	Duration of Exams.	Internal Assessment Marks	Semester end Exam Marks	Total Marks	Credits
I	Theory	DSC ELET:101	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ELEP:102	04 hrs	52	03 hrs	10	40	50	02
II	Theory	DSC ELET:201	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ELEP:202	04 hrs	52	03 hrs	10	40	50	02
III	Theory	DSC ELET:301	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ELEP:302	04 hrs	52	03 hrs	10	40	50	02
IV	Theory	DSC ELET:401	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSC ELEP:402	04 hrs	52	03 hrs	10	40	50	02
V	Theory	DSE ELET:501A **OR** ELET:501B	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSE ELEP:502	04 hrs	52	03 hrs	10	40	50	02
	Practical	SEC-1 ELEP:503	04hrs	52	03hrs	10	40	50	02
		SEC-2 ELEP:504	04hrs	52	03hrs	10	40	50	02
VI	Theory	DSE ELET:601A **OR** ELET:601B	04 hrs	60	03 hrs	20	80	100	04
	Practical	DSE ELEP:602	04 hrs	52	03 hrs	10	40	50	02
	Practical	SEC-1 ELEP:603	04hrs	52	03hrs	10	40	50	02
		SEC-2 ELEP:604	04hrs	52	03hrs	10	40	50	02
Total			56hours	880hours	42hours	220	880	1100	44

*Creditmeanstheunitbywhichthecourseworkismeasured.One hoursessionofLectureperweekfor16weeksamounts to1credit.FourhourssessionofPracticalsperweekfor16weeks amounts to 2 credits persemester.

** Student has to choose only one elective(DSE) during his/her fifth and sixth semester.

Discipline Specific Course(DSC), Discipline Specific Elective and Skill Enhancement Course Topics under CBCS in Electronics

Sem	Type	Course
1	DSC ELET:101	**BASIC ELECTRONICS**
	DSC ELEP:102	**PRACTICALS 1**
2	DSC ELET:201	**LINEAR AND DIGITAL INTEGRATED CIRCUITS**
	DSC ELEP:202	**PRACTICALS 2**
3	DSC ELET:301	**COMMUNICATION ELECTRONICS**
	DSC ELEP:302	**PRACTICALS 3**
4	DSC ELET:401	**PHOTONICS AND MICROCONTROLLER**
	DSC ELEP:402	**PRACTICALS 4**
5	DSE ELET:501A **OR** ELET:501B	**C-Programming, VLSI and Embeded System (Elective)** **OR** **Sensors,C-Programming and Embedded System (Elective2)**
	DSE ELEP:502A **OR** ELEP:502B	**PRACTICALS 5**
	SEC-1 ELEP:503	**EMBEDDED SYSTEMS EXPERIMENTS USING MICROCONTROLLER/ARDUINO PRACTICALS 6**
	SEC-2 ELEP:504	**PCB DESIGN AND SIMULATION EXPERIMENTS PRACTICALS 7**
6	DSE ELET:601A **OR** ELET:601B	**Power Electronics and DSP (Elective 1)** **OR** **Power Electronics VLSI,VHDL and Python (Elective 2)**
	DSE ELEP:602A **OR**ELEP:602B	**PRACTICALS 8**
	SEC-1 ELEP:603	**PC HARDWARE AND BASIC NETWORKING CONCEPTS PRACTICALS 9**
	SEC-2 ELEP:604	**PROJECT WORK PRACTICALS 10**

Question Paper Pattern

B.Sc. I, II, III, IV & V and VI Sem (CBCS)

Subject: ELECTRONICS

I) Maximum Marks = 80
II) Question paper is divided into four parts such as PART A, PART B, PART C and PARD.
III) Each PART is set for 20 marks.
IV) Equal weightage may please be given to all the topics.
V) The pattern of questions in each part is given below.

PART A: TWO MARKS Questions

1. This part should contain 12(Twelve) questions covering all the topics of syllabus.
2. Each Question carries 2 Marks.
3. Students are required to answer any 10 questions.
4. Questions are of short answer type/simple problems involving one or two steps/ Drawing circuit/Ray diagram.
5. At least 3 Questions in this part are of problem solving type.
6. Multiple choice Questions should be avoided.
7. Total Marks for Part A: 2x10 =20

PART B: FIVE MARKS Questions

1. This part should contain 06(Six) questions covering all the topics of syllabus.
2. Each Question carries 5 Marks.
3. Students are required to answer any 4 questions.
4. Questions are of descriptive type/derivation type/Shortnote type.
5. Questions on Numerical problems should not be askedin this part.
6. Total Marks for Part B:5x4 = 20

PART C: FOUR MARKS Questions

1. This part should contain 08(eight) Numerical problems covering all the topics of syllabus.
2. Each Question carries 4 Marks.
3. Students are required to answer any 5 questions.
4. Total marks for Part C: 4x5=20

PART D: TEN MARKS Questions

1. This part should contain 04(four) questions covering all the topics of syllabus.
2. Each Question carries 10 Marks.
3. Students are required to answer any 2 questions.
4. Questions are of descriptive type/derivation type/Shortnote type/long answer type only.
5. Questions on Numerical problems should not be askedin this part.
6. Wherever necessary each Question may be split into two or 3 sub questions as required by paper setter.
7. Total Marks for part D: 10x2 = 20

Note: This is main structure of question paper. Question paper setter may be permitted to make small modification while giving equal weightage to topics in descriptive type and numerical type questions.

B.Sc.I,II,III,IV,V and VIsemester (CBCS)

Scheme Of Evaluation For Practical Examinations In Electronics

1. Basicformulawithdescriptionofquantities, Units&Natureofgraph. -04Marks
2. CircuitDiagram/RayDiagram/Schematicdiagram with properlabeling. -04Marks
3. TabularColumnwithQuantitieiesandUnitMentioned. -04Marks
4. Experimental Skills. -04Marks
5. Recordingofobservations -08Marks
6. Calculationsanddrawing graph -06Marks
7. AccuracyofResult -02Marks
8. Viva-Voce -04Marks
9. Completed &CertifiedJournal -04Marks
10. Total -40 Marks

Scheme of Evaluation for Calculation Type Experiments

1. BasicFormulawithdescription -05Marks
2. TabularColumn -05Marks
3. CalculationofRequiredQuantitiesfora dataset1 -10Marks
4. CalculationofRequired Quantitiesfora dataset-2 -10Marks
5. AccuracyofResult -02Marks
6. Viva-Voce -04Marks
7. Completed&CertifiedJournal -04Marks
8. Total -40 Marks

Scheme of Evaluation for Computer Programming

1. Writing two programmes -16 Marks
2. Execution of any one programme -16 Marks
3. Viva-Voce -04Marks
4. Completed&CertifiedJournal -04Marks
5. Total -40 Marks

CBCS Syllabus w.e.f. 2020-21
B.Sc. FIRST SEMESTER
Optional Subject: ELECTRONICS(DSC-ELET:101)
BASIC ELECTRONICS
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Circuit Analysis(08hours):

Concept of voltage and currentsources. Superposition theorem.Thevenin'stheorem. Norton's theorem.Reciprocitytheorem.Maximumpower transfer theorem. Two port networks: z,y and h parameters and their interconversions.

Measuring Instruments(07 hours):

Principle of voltmeter, multirange voltmeter (AC and DC), loading effect.Principle of ammeter, multirange ammeter (AC and DC),Principle of Ohmmeter, series and shunt type ohmmeter. Multimeters: Analog and digital multimeters(qualitative).

CRO: Use of CRO (frequency, voltage ,phase, Lissajous pattern).

Junction Diode and its applications(15 hours):

p-n junction diode (Ideal and practical): Construction, Formation of depletion layer, and V-I characteristics. Static and dynamic resistance, dc load line and Quiescent point(Q).Zener diode: V-I characteristics, Reverse saturation current, Zener and avalanche breakdown.Rectifiers: Half wave rectifier, Full wave rectifierandbridgerectifier(Circuit diagrams, working and waveforms, ripple factor and efficiency). Filters: Shunt capacitor filter-working, output waveform and its role in power supply. Regulation: Line and load regulation. Zener diode as voltage regulator.

Bipolar Junction Transistor(BJT)&FET (15 hours):

Transistor, Types of transistors, characteristics of transistor in CE and CB configurations. Regions of operation (active, cut off and saturation), Current gains(α and β) and relations between them. dc load line and Q point. Transistor biasing circuits: Fixed Bias and Voltage Divider Bias(Thermal runaway, stability and stability factor S). h-parameter analysis of a transistor in CE mode.

FET:FET types, JFET-Construction, working, characteristics, parameters and the relation between them.

Amplifiers and Oscillators (15 hours):

Small signal analysis of single stage RC coupled CE amplifier using h-parameters. Expressions forinput& output impedance, current and voltage gains. Two stage RC Coupled CE amplifier and its frequency response. Class A, B and C amplifiers (qualitative).

Feedback in Amplifiers: Concept of feedback,negative and positive feedback, expression for gain with feedback (negative and positive feedback). Working of emitter follower circuit. Advantages of negative feedback.

Sinusoidal Oscillators: Barkhausen criterion for sustained oscillations. Phase shift, Wein bridge and Colpitt'soscillators-condition for oscillation and expression for frequency.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference Books:

1. Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004).
2. Electrical Circuits, M. Nahvi& J. Edminister, Schaum's Outline Series.
3. Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press.
4. Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.
5. Electronic Devices and Circuits, David A. Bell, 5th Edition 2015.
6. Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove.
7. Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning.
8. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6thEdn.
9. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001).
10. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series.
11. Allen Mottershead, Electronic Devices and Circuits, Goodyear.

List of first Semester ELECTRONICS(DSC-ELEP:102) Experiments:

1. Measurement of amplitude, frequency &phase difference using CRO(Demonustartion only).
2. h-parameters of a two port network.
3. Verification of Thevenin's and Norton's theorems.
4. Verification of Superposition theorem/Reciprocity theorem.
5. Verification of maximum power transfer theorem.
6. Half wave rectifier and Full wave rectifier.
7. Bridge Rectifier with C- filter andπ- section filter.
8. Zener diode as voltage regulator.
9. FETcharacteristics.
10. Study of Fixed Bias and Voltage divider bias for CE mode.
11. Design a Single Stage RC coupled CE amplifier and study its frequency response.
12. Study of RC Phase Shift oscillator/Wein bridge oscillator.
13. Study of Colpitt's oscillator.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of Eight experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2020-21
B.Sc. SECOND SEMESTER
Optional Subject: ELECTRONICS(DSC-ELET:201)
LINEAR AND DIGITAL INTEGRATEDCIRCUITS
(Credits: Theory-04, Practicals-02) Theory: 60 Hours

Integrated circuits(03 hours): Introduction, classification ofIC's, comparsion between different IC's and advantages.

Operational Amplifiers& its applications (12 hours): Block Diagram of Op-amp**,** Characteristics of an Ideal and practical Op- amp(IC 741), Operational amplifier parametrs, Open and closed loop configurations and frequency response. Concept of virtual ground.

Applications: Inverting and Non-inverting amplifiers, summing and difference amplifier, differentiator, Integrator, Wein bridge oscillator, Comparator and Zero-crossing detector, and active low pass and high pass Butterworth filter (First order only).

Clock and Timer (IC 555): Introduction, Block diagram of IC 555, Astable and monostablemultivibrator circuits.

Number System,Boolean Algebra and Logic gates (15 hours):

Number System**:** Decimal**,** Binary, Octal and Hexadecimal number systems and their interconversions. Representation of signed and unsigned numbers.Addition and subtraction by 1's &2's complementmethod.BCD, Gray& ASCII code. Binary to Grey conversion and vice-versa.

Boolean algebra: Basic postulates and fundamental theorems of Boolean algebra,positive and negative logic.

Logic Gates: Study of basic gatesOR, AND, NOT. Derived gates NOR, NAND, XOR, XNOR. Universal property of NAND and NOR gates.Realisation of Boolean equation using logic gates. deMorgan'stheorems and its applications.Logic families: RTL, DTL, TTL, and CMOSand their characteristics.

Combinational Logic Analysis and Design (15 hours): Standard representation of logic functions (SOP and POS), minimization Techniques,Karnaughmapminimization up to 4variables for SOP.

Arithmetic Circuits: Half and Full Adder, Half and Full Subtractorand 4- bit binaryAdder and Subtractor. Two bit comparator,encoder,decimal to BCD Priorityencoder, decoder 2:4 using AND gates and 3:8 using NAND gates. BCD to decimaldecoder. Multiplexer (4:1 using gates) and demultiplexer (1:4 using gates).

Digital to analog(D/A) and Analog to Digital(A/D): 4 bit binary weighted and R-2R D-A converters, working, accuracy and resolution.A/D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Sequential Circuits(15 hours): RS, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. Master-slave JK Flip-Flop.

Shift Registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

Counters: Asynchronous counters-logic diagram, truth table and timing diagram of 3-bit ripple counter, 3-bit up-down asynchronous counter and decade counter. Ring Counter, Johnson counter and their applications.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference Books:

1. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000.
2. Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011.
3. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed..
4. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009.
5. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
6. Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001.
7. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994).
8. R. L. Tokheim, Digital Principles, Schaum's Outline Series.
9. Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill.

List of Second semester ELECTRONICS(DSC-ELEP:202) Experiments

1. Design inverting and non-inverting amplifier using Op-amp(741) for dc/ac voltages & study its frequency response.
2. Op-amp asan adder using inverting/non-inverting mode and comparator.
3. Op-amp as Integrator and Differentiator.
4. Wein bridge oscillator using an op-amp.
5. Design a Butterworth low pass active filter (1^{st} order) & study its frequency response.
6. Design a digital to analog converter.
7. Design a combinational logic system for (i) a givenBoolean expression and (ii) Truth table. Realise it using logic gates.
8. Half Adder and Full Adder/ Half Subtractor and Full Subtractor.
9. Seven segment decoder.
10. MonostableMultivibrator using IC 555 Timer.
11. JK Master-slave flip-flop using Flip-Flop ICs.
12. Counter using D-type/JK Flip-Flop ICs.
13. Grey to binary condition and vice-versa.
14. Verification of deMorgan's theorem.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of Eight experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2021-22
B.Sc.THIRD SEMESTER
Optional Subject: ELECTRONICS(DSC-ELET:301)
COMMUNICATION ELECTRONICS
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Electronic Communication (15 hours): Introduction, means and modes of communication.Block diagram of an electronic communication system.Electromagnetic communication spectrum, band designations and usage.Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

Radio wave propagation: Ionosphere, propagation of EM waves through Ionosphere, skip-distance, maximum usable frequency, virtual height and critical frequency, critical angle and fading.

Analog Modulation: Need for modulation, types of modulation.Theory of Amplitude Modulation, modulation index and its importance and frequency spectrum. Power relation in an AM wave. AM modulator (Emitter Modulation). Frequency modulation(FM): Theory of Frequency modulation, modulation index and frequency spectrum.Generation of FM using VCO. Demodulation: Amplitude Demodulation (diode detector), Concept of Single side band generation and detection.FM detector (slope detector).Comparision between AM and FM. Reciever: Introduction, Characteristics and Block diagram of Super heterodyne receiver.

Analog and Digital Pulse Modulation (15 hours):

Analog Pulse Modulation: Channel capacity, Sampling theorem, Basic Principles- PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

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 Binary Phase Shift Keying (BPSK).

Satellite and Optical Fiber Communication(15 hours):

Satellite Communication- Introduction, need, Geosynchronous satellite orbits, geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

OFC; Introduction, block diagram of optical fiber system, principle, advantages, types of fiber optic cables, light propagation through fiber, expression for numerical aperture and acceptance angle. Types of light sources and detectors, losses in optical fiber (Qualitative).

Mobile Telephony System (**15 hours**):Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, 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).

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference Books:

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition.
4. Electronic Communication systems, G. Kennedy, 3rdEdn., 1999,
5. Principles of Electronic communication systems - Frenzel, 3rd edition.
6. Communication Systems, S. Haykin, 2006, Wiley India.
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press.
9. Electronic Communication system, Blake, Cengage, 5th edition.

List of Third semester ELECTRONICS(DSC-ELEP:302) Experiments:

1. Amplitude Modulator using Transistor.
2. Envelope detector for demodulation of AM signal.
3. FM - Generator and Detector circuit.
4. AM Transmitter and Receiver.
5. Pulse Amplitude Modulation (PAM).
6. Pulse Width Modulation (PWM).
7. Pulse Position Modulation (PPM).
8. ASK/PSK/FSK modulators.
9. Numerical aperture of OFC.
10. Characteristics of OFC.
11. Bending losses in OFC.
12. Verification of Sampling theorem.
13. Frequency response of loud speaker.
14. Impedence characteristics of microphone.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of Eight experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2021-22
B.Sc. FOURTH SEMESTER
Optional Subject: ELECTRONICS(DSC-ELET:401)
PHOTONICS AND MICROCONTROLLER
(Credits: Theory-04, Practicals-02) Theory: 60 Hours

Photonic Devices (15 Hours) : Classification of photonic devices.Interaction of radiation and matter, Radiative transition and optical absorption. Light Emitting Diodes-Construction, materials and operation. Semiconductor Laser- Condition for amplification, laser cavity, heterostructure and quantum well devices. Charge carrier and photon confinement, line shape function.Thresholdcurrent.Laser diode.

Photo detectors & Display devices(15 Hours): Photoconductor, Photo diodes, Photo transistors and Solar Cell (Construction, working, V- I Characteristics and applications), quantum efficiency and responsivity. Photomultiplier tube.

LCD Displays:Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

Introduction to Microprocessor and Microcontroller(8051) (30 Hours): Microprocessor, explaination of Basic block diagram of microprocessor**,** Computing languages; machine language, Assembly language,higher level language, Assembler, Compiler, interpreter.Basic block diagram of microcontroller, comparison of microcontroller with microprocessor.Evolution of Microcontrollers, 8 bit, 16 bit and 32 bit microcontrollers.**Microcontroller 8051**- Features, Architecture, general purpose and special purpose/function registers, Program Status Word (PSW) register,SP, PC, DPTR, memory organization , Internal RAM, Internal ROM and external memory. Pin diagram of 8051, I/O ports and their functions. **Counters and Timers** – 8051 oscillator and clock, program counter, TCON, TMOD, timer/ counter logic, timer modes of operation, serial data input / output – SCON, PCON, serial data transmission modes.

8051 Programming: 8051 addressing modes, PUSH and POP instructions, accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, JUMP and CALL instructions, 8051 programming (ALP) for arithmetic & logic operations, JUMP and CALL instructions ,time delay & I/O operations and manipulation.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference Books:

1. Optoelectronic Devices and Systems, Gupta, 2nd edn., PHI learning.
2. Electronic Devices and Circuits, David A. Bell, 2015, Oxford University Press.
3. Optoelectronics & Photonics, S.O. Kasap Pearson Education (2009).
4. Photonics and Lasers, Richard. S Quimby
5. Fundamentals of Microprocessor andmicrocumputers, B.Ram
6. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.

7. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
8. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press

List of FOURTH Semester ELECTRONICS(DSC-ELEP:402) Experiments

1. Characteristics of LED.
2. Characteristics of LDR.
3. Characteristics of Photodiode.
4. Characteristics of Phototransistor.
5. Solar cell characteristics.
6. ALP for Addition, subtraction, multiplication and Division of 8-bit number.
7. ALP for Addition and subtraction of two 16-bit number and store the result.
8. ALP to find 2's compliment of i) 8-bit and ii) 16-bit numbers.
9. ALP to find average of five 8-bit numbers and store the result.
10. ALP to find largest/Smallest of N given numbers.
11. ALP to find Square and Cube of an 8-bit number.
12. ALP to count number of o's and 1's of an 8-bit data.
13. ALP to find whether the given data is palindrome or not.
14. ALP to arrange the numbers in ascending and descending order.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of Eight experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. FIFTH SEMESTER
(Student shall chose either Paper-I or Paper-II)
Optional Paper-I: ELECTRONICS(DSE-ELET:501A)
C-Programming, VLSI and EmbededSystem(Elective1)
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Computer Concepts and C programming(30 hours): System software, Operating system, Application software, Machine level language, Assembly language, higher level programming languages, Assemblers, Compilers and editors. Basic programming concepts-Algorithm, flowcharts, Modular programming and structured programming.
Importance of C, basic structure of C programming style, execution of C program, C tokens, Keywords and identifiers, constants, variables and data types, declaration of variables, assigning value to variables, defining symbolic constants. Operators and Expressions (All types).
Decision Making, Branching and Looping: Decision making with IF statement, IF ELSE statement, nested IF, the switch statement, the "?" operator, the GOTO, WHILE, DO WHILE and FOR statements. Arrays: one and two dimension arrays, initializing of arrays, Multidimensional arrays, Declaring and initialising string variables, reading and writing of strings, Arithmetic operators, String handling functions.
Functions : Function definition, arguments and parameters, local and global variable, Function declaration.Category of functions: no arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value. Related C-programs.
VLSI Processing (15) : Introduction of Semiconductor Process Technology, Clean RoomClassification, Line width, Photolithography: Resolution and Process, Positive and Negative Shadow Masks, Photoresist, Step Coverage, Developer. Electron Beam Lithography. Idea of Nano-Imprint Lithography. Etching: Wet Etching. Dry etching (RIE and DRIE). Basic Fabrication Process of R, C, P-N Junction diode, BJT, JFET, MESFET, MOS, NMOS, PMOS and CMOS technology. Wafer Bonding, WaferCutting, Wire bonding and Packaging issues (Qualitative idea)
Introduction to Embedded system(15): Embedded systems and general-purpose computer systems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.
versions, bridge invertors.
Introduction to Arduino & Basic Conceot of Arduino: Pin configuration and architecture. Device and platform features. Concept of digital and analog ports. Familiarizing with Arduino Interfacing Board. Introduction to Embedded C and Arduino platform. Arduino data types. Variables and constants. Operators Control Statements Arrays Function. Pins Configured as INPUT, Pull-up Resistors. Pins Configured as OUTPUT.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference books

1. Computer fundamentals - Anita Goel, Pearson Edition.
2. Fundamentals of Computers - V Rajaram, NeeharikaAdabala - PHI.
3. Computer concepts and C-programmimng, P.B.Kotur.
4. Let Us C ,YashavantKanetkar, BPB Publications
5. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
6. Byron S Gottfried, Programming with C ,Schaum Series .
7. Essentials of VLSI circuits: Kamran,Douglas,Sholeh
8. VLSI Design :Debaprasad Das
9. Introduction to CMOS VLSI Design: Dr S Roy Chowdhury
10. C Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India.
11. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill.
12. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning.
13. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill.

List of FifthSemester ELECTRONICS(DSC-ELEP:502A) Experimentsfor Elective(1)

1. C-program to find i)area of a triangle ii) area of triangle when sides are given iii) area of a circle.
2. C-program using if-else statement i)to check whether given number is odd or even ii)to find whether a given integer is positive or negative.
3. C-program to find largest and smallest of given numbers.
4. C-program to find the roots of a quadratic equation.
5. C-program to illustrate switch statement.
6. C-program to find factorial of a number using while, do and for loops.
7. C-program to generate the Fibonacci series.
8. C-program to find the sum & difference of two matrices using arrays.
9. C-program to find reverse of a number and to check whether it is a palindrome or not.
10. C-program to illustrate any two string handling functions.
11. C-program to find sum of odd and even numbers using functions.
12. C-program to generate and print prime numbers up to an integer N.
13. C-program to find the GCD of two integer numbers.
14. C-program to sort given N numbers in ascending/descending order.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of twelve programmes to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. FIFTH SEMESTER
(Student shall chose either Paper-I or Paper-II)
Optional Paper-II: ELECTRONICS(DSE-ELET:501B)
Sensors,C-Programming and Embedded System(Elective2)
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Instrumentation (Sensors and Applications) (15): Resistance type temperature sensors, Thermistors, thermocouples, solid state sensors,quartz thermometers, radiation type sensors- optical pyrometers. Displacement andstrain transducers: LVDT, strain gauge-types of strain gauges, material for strain gauge. Pressure transducers: elastic transducer, bourdon or helical tubes, piezo electronic pressure transducers.

Computer Concepts and C programming(30 hours): System software, Operating system, Application software, Machine level language, Assembly language, higher level programming languages, Assemblers, Compilers and editors. Basic programming concepts-Algorithm, flowcharts, Modular programming and structured programming.

Importance of C, basic structure of C programming style, execution of C program, C tokens, Keywords and identifiers, constants, variables and data types, declaration of variables, assigning value to variables, defining symbolic constants. Operators and Expressions (All types).

Decision Making, Branching and Looping: Decision making with IF statement, IF ELSE statement, nested IF, the switch statement, the "?" operator, the GOTO, WHILE, DO WHILE and FOR statements. Arrays: one and two dimension arrays, initializing of arrays, Multidimensional arrays, Declaring and initialising string variables, reading and writing of strings, Arithmetic operators, String handling functions.

Functions : Function definition, arguments and parameters, local and global variable, Function declaration. Category of functions: no arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value. Related C-programs.

Introduction to embedded system(15): Embedded systems and general-purpose computer systems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.
versions, bridge invertors.

Introduction to Arduino & Basic Conceot of Arduino: Pin configuration and architecture. Device and platform features. Concept of digital and analog ports. Familiarizing with Arduino Interfacing Board. Introduction to Embedded C and Arduino platform. Arduino data types. Variables and constants. Operators Control Statements Arrays Function. Pins Configured as INPUT, Pull-up Resistors. Pins Configured as OUTPUT.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference books

1. Sensors and Transduscers : D Patranabis.
2. Sensors and Transduscers: M J Usher.
3. Computer fundamentals - Anita Goel, Pearson Edition.
4. Fundamentals of Computers - V Rajaram, NeeharikaAdabala - PHI.
5. Computer concepts and C-programmimng, P.B.Kotur.
6. Let Us C , YashavantKanetkar, BPB Publications
7. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
8. Byron S Gottfried, Programming with C ,Schaum Series .
9. C Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India.
10. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill.
11. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning.
12. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill.

List of Fifth Semester ELECTRONICS(DSC-ELEP:502B) Experiments for Elective(2)

1. To determine the Characteristics of LVDT.
2. To determine the Characteristics of Thermistors and RTD.
3. Characteristics of one Solid State sensor/ Fiber optic sensor.
4. C-program to find i)area of a triangle ii) area of triangle when sides are given iii) area of a circle.
5. C-program using if-else statement i)to check whether given number is odd or even ii)to find whether a given integer is positive or negative.
6. C-program to find largest and smallest of three numbers.
7. C-program to find the roots of a quadratic equation.
8. C-program to illustrate switch statement.
9. C-program to find factorial of a number using while, do and for loops.
10. C-program to generate the Fibonacci series.
11. C-program to find the sum & difference of two matrices using arrays.
12. C-program to find reverse of a number and to check whether it is a palindrome or not.
13. C-program to illustrate any two string handling functions.
14. C-program to find sum of odd and even numbers using functions.
15. C-program to generate and print prime numbers up to an integer N.
16. C-program to find the GCD of two integer numbers.
17. C-program to sort given N numbers in ascending/descending order.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of twelve experiments/programmes to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. FIFTH SEMESTER

Skill Enhancement Course(SEC-1) in Electronics(SEC-ELEP:503)
Embedded Systems experiments using microcontroller/Arduino
(Credits: -02) Total practical Teaching hours: 60 Hours

Experiments using Microcontroller Interfacing/Arduino.

1. Basics of Arduino IDE and fundamentals of writing embeddedC-program .
2. LED blinking using Arduino (Uno/Pro)/microcontroller.
3. Interfacing LED/buzzer and a Switch with Arduino/microcontroller.
4. Stepper motor interfacing withArduino/microcontroller.
5. 4x4 matrix Keypad interfacing with Arduino microcontroller.
6. Interfacing a relay with Arduino using ULN 2803/L293D.
7. Number Displaying on 7-segment display using Arduino/ microcontroller.
8. Interfacing 16X2 LCD /GLCD module with Arduino.
9. Arduino based digital thermometer.
10. IR remote decoder using Arduino.
11. RF Transmitter and receiver module interfacing with Arduino.
12. Intefacing RFID module with Arduino.
13. Interfacing ultrasonic sensor with Arduino.
14. Interfacing GPS module with Arduino.
15. Interfacing GSM module with Arduino.
16. Fingerprint sensor interfacing with Arduino.
17. Speech recognition using Arduino.

Note:

1. **Experiments of four hours duration.**
2. **Minimum of seven experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. FIFTH SEMESTER

Skill Enhancement Course(SEC-2) in Electronics(SEC-ELEP:504)

PCB design and simulation Experiments

(Credits: -02) Total practical Teaching hours: 60 Hours

1. Introduction to circuit creation and simulation software TINA student edition/Multisim.
2. Simulation of rectifier circuits half wave, full wave bridge rectifier and observe the outputs using virtual oscilloscope.
3. Simulation of full wave bridge rectifier with LC and π section filters and observe the outputs using virtual oscilloscope.
4. Power supply design with regulators LM7805 and LM7812.
5. Designing of clipper circuits and observe the output waveform using virtual oscilloscope.
6. Designing of clamper circuits and observe the output waveform using virtual oscilloscope.
7. Astable and monostable multivibrator using BC 547. Observe the outputs using virtual oscilloscope.
8. Op-Amp inverting/non inverting amplifier simulation. Observe the outputs using virtual oscilloscope.
9. Op-Amp instrumentation amplifier design and simulation. Observe the outputs using virtual oscilloscope.
10. AM modulation and demodulation. Observe the outputs using virtual oscilloscope.
11. FM modulation and demodulation.Observe the outputs using virtual oscilloscope.
12. ASK and FSK modulation and demodulation. Observe the outputs using virtual oscilloscope.
13. Single side PCB Layout design using CAD tool.
14. Development of PCB in hardware Lab using printing, etching , drilling and coating.
15. Fabrication of single side PCB for full wave rectifier circuit and resistive load in the lab.

Note:

1. **Experiments of four hours duration.**
2. **Minimum of seven experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. SIXTH SEMESTER
(Student shall chose either Paper-I or Paper-II)
Optional Paper-I: ELECTRONICS(DSE-ELET:601A)
Power Electronics and DSP **(Elective 1)**
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Power control Devices (15 hours):

Need for semiconductor power devices, Power MOSFET(Qualitative). Introduction to family of thyristors. Silicon Controlled Rectifier (SCR)- structure, I-Vcharacteristics, Turn-On and Turn-Off characteristics, ratings, Gate-triggering circuits.

Diac and Triac- Basic structure, working and V-I characteristics. UJT : Construction, working and V-I characteristics.

Insulated Gate Bipolar Transistors (IGBT): Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA).

Applications of power control devices(15 hours): Phase controlled rectification, AC voltage control using SCR and Triac as a switch. . Application of Diac as a triggering device for Triac. UJT as a relaxation oscillator Power Invertors- Need for commutating circuits and their various types, dc link invertors, Parallel capacitor commutated invertors, Series Invertor, limitations and its improved.

Discrete-Time Signals and Systems(15 hours): Classification of Signals, Transformations of the Independent Variable, Periodic and Aperiodic Signals, Energy and Power Signals, Even and Odd Signals, Discrete-Time Systems, System Properties. Impulse Response, Convolution Sum; Graphical Method; Analytical Method, Properties of Convolution; Commutative; Associative; Distributive; Shift; Sum Property System Response to Periodic Inputs, Relationship Between LTI System Properties and the Impulse Response; Causality; Stability; Invertibility, Unit Step Response.

Discrete-Time Fourier Transform: Fourier Transform Representation of Aperiodic Discrete-Time Signals, Periodicity of DTFT, Properties; Linearity; Time Shifting; Frequency Shifting; Differencing in Time Domain; Differentiation in Frequency Domain; Convolution Property.

The z-Transform(15 hours): Bilateral (Two-Sided) z-Transform,Inverse z-Transform, Relationship Between z-Transform and Discrete-Time Fourier Transform, z-plane, Region-of-Convergence; Properties of ROC, Properties; Time Reversal; Differentiation in the z-Domain; Power Series Expansion Method (or Long Division Method); Analysis and Characterization of LTI Systems; Transfer Function and Difference-Equation System. Solving Difference Equations.

Filter Concepts: Phase Delay and Group delay, Zero-Phase Filter, Linear-Phase Filter, Simple FIR Digital Filters, Simple IIR Digital Filters, All pass Filters, Averaging Filters, Notch Filters.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference Books:

1. Electronic devices by David Bell.
2. Power electronics, circuits, devices and applications by Mohammed Rashid.
3. Power electronics by P.S. Bimbhra.
4. Digital Signal Processing, Tarun Kumar Rawat, 2015, Oxford University Press, India.
5. Digital Signal Processing, S. K. Mitra, McGraw Hill, India.
6. Fundamentals of Digital Signal processing using MATLAB, R.J. Schilling and S.L. Harris, 2005, Cengage Learning
7. Principles of Signal Processing and Linear Systems, B.P. Lathi, 2009, 1st Edn. Oxford University Press.
8. Fundamentals of signals and systems, P.D. Cha and J.I. Molinder, 2007, Cambridge University Press.
9. Digital Signal Processing Principles Algorithm & Applications, J.G. Proakis and D.G. Manolakis, 2007, 4th Edn., Prentice Hall.

CBCS Syllabus w.e.f. 2022-23
B.Sc. SIXTH SEMESTER
(Student shall chose either Paper-I or Paper-II)
Optional Paper-II: ELECTRONICS(DSE-ELET:601B)
PowerElectronics VLSI, VHDL and Python **(Elective 2)**
(Credits:Theory-04, Practicals-02) Theory: 60 Hours

Power Electronics (15): SCR,DIAC, and TRIAC,(Construction,working and their characteristics). Applications:SCR as halfwave rectifier and power control device, DIAC as a lamp dimmer, TRIAC as an electronic switch. UJT construction, working and characteristics, UJT as relaxation oscillator, expression for frequency of 0scillation.

Introduction to Python(15 hours): History, Introduction to Python, Why Python? Features, setting up path, working with Python, Basic Syntax, Python Variables and Data Types, Operators with examples. **Conditional Statements:** If, If- else and Nested if-else statements with examples.**Looping:** For, While, Nested loops with examples.**String Manipulation**: Accessing Strings, Basic Operations, String slices, Function and Methods with examples.

Data Types(Lists,Tuples, Dictionaries): Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Discrete-Time Signals and Systems(15 hours): Classification of Signals, Transformations of the Independent Variable, Periodic and Aperiodic Signals, Energy and Power Signals, Even and Odd Signals, Discrete-Time Systems, System Properties. Impulse Response, Convolution Sum; Graphical Method; Analytical Method, Properties of Convolution; Commutative; Associative; Distributive; Shift; Sum Property System Response to Periodic Inputs, Relationship Between LTI System Properties and the Impulse Response; Causality; Stability; Invertibility, Unit Step Response.

Discrete-Time Fourier Transform: Fourier Transform Representation of Aperiodic Discrete-Time Signals, Periodicity of DTFT, Properties; Linearity; Time Shifting; Frequency Shifting; Differencing in Time Domain; Differentiation in Frequency Domain; Convolution Property.

The z-**Transform(15 hours):** Bilateral (Two-Sided) z-Transform,Inverse z-Transform, Relationship Between z-Transform and Discrete-Time Fourier Transform, z-plane, Region-of-Convergence; Properties of ROC, Properties; Time Reversal; Differentiation in the z-Domain; Power Series Expansion Method (or Long Division Method); Analysis and Characterization of LTI Systems; Transfer Function and Difference-Equation System. Solving Difference Equations.

Filter Concepts: Phase Delay and Group delay, Zero-Phase Filter, Linear-Phase Filter, Simple FIR Digital Filters, Simple IIR Digital Filters, All pass Filters, Averaging Filters, Notch Filters.

Note:

1. **Number of teaching hours per week are four.**
2. **Total teaching hours are inclusive of solving numerical problems on all the topics.**
3. **Preference may be given to solve maximum number of numerical problems.**

Reference books:

1. Digital Signal Processing, Tarun Kumar Rawat, 2015, Oxford University Press, India.
2. Digital Signal Processing, S. K. Mitra, McGraw Hill, India.
3. Fundamentals of Digital Signal processing using MATLAB, R.J. Schilling and S.L. Harris, 2005, Cengage Learning
4. Principles of Signal Processing and Linear Systems, B.P. Lathi, 2009, 1st Edn. Oxford University Press.
5. Fundamentals of signals and systems, P.D. Cha and J.I. Molinder, 2007, Cambridge University Press.
6. Digital Signal Processing Principles Algorithm & Applications, J.G. Proakis and D.G. Manolakis, 2007, 4th Edn., Prentice Hall.
7. Principles of Signal Processing and Linear Systems, B.P. Lathi, 2009, 1st Edn. Oxford University Press.
8. Python Programming for the Absolute Beginner, Michael Dawson, 3rd Edition, Cengage Learning, 2010
9. Python Programming with Raspberry Pi, SaiYamanoor, SrihariYmanoor, Packt Publishing, 2017
10. Learning Python with Raspberry Pi, Alex Bradbury, Ben Everard, John – Wiley and Sons, 2014

List of sixth semester ELECTRONICS(DSC-ELEP:602)Experiments common to both
Elective 1 and Elective 2:

1. Study of I-V Characteristics of DIAC.
2. Study of I-V Characteristics of a TRIAC.
3. Study of I-V Characteristics of a SCR.
4. UJT Characteristics.
5. UJT as relaxation Oscillator.
6. SCR as Power control device.
7. DC Motor Control using TRIAC**.**
8. Familiarization with DSP simulation software
9. Generation simple signals –sine wave, square wave,
10. Generation of ramp, unit step and impulse functions.
11. Generation of Signals: continuous time
12. Generation of Signals: discrete time
13. Convolution of Signals
14. Generation of unit sample sequence,
15. Design of an FIR filter low pass and high pass.

Note:

1. **Experiments are of four hours duration.**
2. **Minimum of Eight experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. SIXTH SEMESTER

Skill Enhancement Course(SEC-1) in Electronics(SEC-ELEP:603)

PC Hardware and basic Networking Concepts

(Credits: -02) Total practical Teaching hours: 60 Hours

1. Identifying the peripherals of a computer (SMPS, Motherboard, RAM, HDD etc), understanding the ports and connections.
2. Assembling and disassembling of PC. (Old dummy PC can be used for this purpose).
3. Understanding BIOS, Partitioning the HDD and installing Windows Operating System.
4. Installing device drivers, understanding the control panel settings, Adding users, assigning permissions to files and folders.
5. Installation of Antivirus and application software (Ex: Ms Office, Adobe Reader etc).
6. Preventive maintenance, Defragmentation,taking backup, updating antivirus, using virus removal tools etc.
7. Cabling fundamentals. Straight through and cross over cabling, Usage of Crimping tool and cable tester.
8. Install and Configure Wired and/or Wireless NIC and Configuring TCP/IP settings(host IP, Subnet mask and default gateway) to establish LAN.
9. Establish Peer to Peer network connection using two/more systems using Switch/ Router in a LAN. Joining computers to the LAN.
10. Configure Internet connection and Internet connection sharing. Saving files and folders in cloud storage.
11. Sharing of files and folders in LAN.File transfer using FTP. Configuring print server and sharing of printer in the network.
12. Study of basic network configuration commands like IPCONFIG, PING / Tracer and Net stat utilities to debug the network issues. Usage of Packet tracer.

Note:

1. **Experiments of four hours duration.**
2. **Minimum of seven experiments to be performed.**
3. **Any new experiment may be added to the list with the prior approval from the BOS.**

CBCS Syllabus w.e.f. 2022-23
B.Sc. SIXTH SEMESTER

Skill Enhancement Course(SEC-2) in Electronics(SEC-ELEP:604)

PROJECT WORK

(Credits: -02) Total practical Teaching hours: 60 Hours

Project Work

a) Marks for External Examination : 40
b) Marks for Internal Evaluation : 10

During the external evaluation of the project, a course Viva-Voce examination has to be conducted. The components for external evaluation of project and course Viva-Voce examination are as follows:

Component	**Marks**
Presentation of the work and Relevance of the project	10
Participation in the project	05
Demonstration of the Project	10
Quality and content of the Project Report	05
Course Viva-Voce	10
Total	**40**

During Course Viva-Voce examination, examiner has to evaluate the involvement and the depth of knowledge of the student in the project work.