

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**Academic Year -2024-25**

**Course Outcomes**

**B.TECH.5<sup>th</sup> SEM**

**Integrated Circuits  
(BEC501)**

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Explain complete internal analysis of Op-Amp 741-IC.
(CO2)	Examine and design Op-Amp based circuits and basic components of ICs such as various types of filters.
(CO3)	Implement the concept of Op-Amp to design Op-Amp based non-linear applications and wave-shaping circuits.
(CO4)	Analyse and design basic digital IC circuits using CMOS technology.
(CO5)	Describe the functioning of application specific ICs such as 555 timer, VCO IC 566 and PLL.

**Microprocessor & Microcontroller (BEC502)**

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Demonstrate the basic architecture of 8085.
(CO2)	Illustrate the programming model of microprocessors & write program using 8085 microprocessors.
(CO3)	Demonstrate the basics of 8086 Microprocessor and interface different external Peripheral Devices like timer, USART etc. with Microprocessor (8085/8086).
(CO4)	Compare Microprocessors & Microcontrollers, and comprehend the architecture of 8051 microcontroller
(CO5)	Illustrate the programming model of 8051 and implement them to design projects on real time problems.

## Digital Signal Processing (BEC503)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Design and describe different types of realizations of digital systems (IIR and FIR) and their utilities.
(CO2)	Select design parameters of analog IIR digital filters (Butterworth and Chebyshev filters) and implement various methods such as impulse invariant transformation and bilinear transformation of conversion of analog to digital filters.
(CO3)	Design FIR filter using various types of window functions.
(CO4)	Define the principle of discrete Fourier transform & its various properties and concept of circular and linear convolution. Also, students will be able to define and implement FFT i.e. a fast computation method of DFT.
(CO5)	Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications

## Integrated Circuits Lab (BEC551)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Design different non-linear applications of operational amplifiers such as log, antilogamplifiers and voltage comparators.
(CO2)	Explain and design different linear applications of operational amplifiers such as filters.
(CO3)	Demonstrate the function of waveforms generator using op-Amp.
(CO4)	Construct multivibrator and oscillator circuits using IC555 and IC566 and perform measurements of frequency and time.
(CO5)	Design and practically demonstrate the applications based on IC555 and IC566.

## Microprocessor & Microcontroller Lab (BEC552)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Use techniques, skills, modern engineering tools, instrumentation and software/hardware appropriately to list and demonstrate arithmetic and logical operations on 8-bit data using microprocessor 8085.
(CO2)	Examine 8085 & 8086 microprocessor and its interfacing with peripheral devices.
(CO3)	State various conversion techniques using 8085 & 8086 and generate waveforms using 8085.
(CO4)	Implement programming concept of 8051 Microcontroller.
(CO5)	Design concepts to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.

## Digital Signal Processing Lab (BEC553)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Create and visualize various discrete/digital signals using MATLAB/Scilab.
(CO2)	Implement and test the basic operations of Signal processing.
(CO3)	Examine and analyse the spectral parameters of window functions.
(CO4)	Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.
(CO5)	Design the signal processing algorithms using MATLAB/Scilab.

## Mini Project (BEC554)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Identify real-world problems and define project objectives based on engineering principles.
(CO2)	Design and develop a technical solution using appropriate tools, technologies, and methodologies.
(CO3)	Analyze system components and integrate them effectively into a functional prototype.
(CO4)	Demonstrate project outcomes through documentation, reports, and presentations.
(CO5)	Work effectively in teams, managing tasks, timelines, and communication for project success.

## Constitution of India (BNC501)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Understand the historical background and philosophy of the Indian Constitution.
(CO2)	Explain the fundamental rights, duties, and directive principles of state policy.
(CO3)	Analyze the structure, powers, and functions of the legislative, executive, and judiciary systems.
(CO4)	Evaluate the role of constitutional bodies and electoral processes in a democratic setup.
(CO5)	Apply constitutional knowledge to real-life civic responsibilities and contemporary legal issues.

## VLSI Technology (BEC-054)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Interpret the basics of crystal growth, wafer preparation and wafer cleaning.
(CO2)	Evaluate the process of Epitaxy and oxidation.
(CO3)	Differentiate the lithography, etching and deposition process.
(CO4)	Analyze the process of diffusion and ion implantation
(CO5)	Express the basic process involved in metallization and packaging.

## Optical Communication (BEC-057)

Course Outcome (CO)	Details of Course Outcomes
(CO1)	Define and explain the basic concepts and theory of optical communication.
(CO2)	Describe the signal losses with their computation and dispersion mechanism occurring inside the optical fiber cable.
(CO3)	Differentiate the optical sources used in optical communication with their comparative study.
(CO4)	Identify different optical components on receiver side; assemble them to solve real world problems related to optical communication systems.
(CO5)	Evaluate the performance of an optical receiver to get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain.

## **CMOS Analog VLSI Design (BEC-058)**

<b>Course Outcome (CO)</b>	<b>Details of Course Outcomes</b>
<b>(CO1)</b>	Analyze the basics concepts of MOSFET and modelling of single stage amplifiers.
<b>(CO2)</b>	Illustrate the various current mirror structures and layout techniques.
<b>(CO3)</b>	Analyze the different types of noise in MOSFET based amplifiers.
<b>(CO4)</b>	Illustrate designing of CMOS based operational amplifiers.
<b>(CO5)</b>	Analyze the stability analysis in MOSFET based amplifiers and oscillators.