

The Bombay Salesian Societies
DOB BOSCO INSTITUTE OF TECHNOLOGY, MUMBAI
DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION

Odd semester 2024-25

Course Name:	BEE		
Course Code	ESC102		
Faculty Name:	Ms. Pratibha Dumane, Ms. Hemlata Mote, Ms Poonam Chakraborty		
Year	1	Sem	I
CO Number	Course Outcome		
ESC102.1	Students will be able to define key terms and concepts related to dc circuits, ac circuits, single phase transformers, electrical machines, diodes and transistors. (Remembering)		
ESC102.2	Students will be able to explain the fundamental concepts, working principles and operations related to dc circuits, ac circuits, single phase transformers, electrical machines, and the characteristics of diodes and transistors. (Understanding)		
ESC102.3	Students will be able to solve problems by applying fundamentals laws, theorems of electricity to given dc and ac circuits and transformers.		
ESC102.4	Students will be able to solve problems by applying fundamentals laws, theorems of electricity to given dc and ac circuits, and explain the application of special-purpose diodes and transistors in electronic circuits. (Applying)		
ESC102.5	Students will be able to evaluate the given dc and ac circuits, efficiency and losses in transformers, and the effectiveness of different transistor configurations in amplification and switching applications. (Evaluating)		
ESC102.6	Students will be able to design basic electrical circuits incorporating DC and AC sources, transformers, electrical machines, and electronic components like diodes and transistors to meet specified performance criteria.		

Course Name:	Engineering Mathematics III		
Course Code	ECC301		
Faculty Name:	Dr. Revathy Sundarajan		
Year	2	Sem	III
CO Number	Course Outcome		
ECC301.1	Students will know the definition of Laplace and Inverse Laplace Transforms, fourier series, even and odd functions, orthogonal trajectories, analytic and harmonic functions, vector and scalar fields, dot and cross product of vectors, characteristic equation and statement of Cayley-Hamilton theorem.		
ECC301.2	Students will obtain the Laplace, Inverse Laplace Transforms of standard functions, check if a given function is even or odd, explain analytic and orthogonal trajectories, understand the concept of similarity, eigenvalues, eigenvectors and its properties, Translate characteristic equation to matrix equation using Cayley-Hamilton theorem, find gradient of a scalar field, curl and divergence of vector fields.		
ECC301.3	Students will make use of properties and theorems to find Laplace and Inverse Laplace Transforms of combinations of standard functions, obtain Fourier series using a standard Fourier Series formula, use Cauchy – Riemann equations to verify analyticity and check if the function is harmonic, use characteristic equation to find eigenvalues and eigenvectors of a given matrix and apply Cayley-Hamilton theorem to obtain inverse and powers of matrix, check whether a given field is irrotational or solenoidal, find work done in any vector field, and find scalar potential for the irrotational field.		
ECC301.4	Students will use a combination of properties and theorems to find Laplace Transform, use partial fractions, derivatives and convolution theorem to find Inverse Laplace Transform, obtain Fourier Series for even and odd functions and Half Range Fourier Series, check if a given function can be the real/imaginary part of an analytic function and construct the corresponding analytic function, obtain harmonic conjugate and orthogonal trajectory, check if a given Matrix is diagonalizable and diagonalize accordingly, find work done in an irrotational vector field, evaluate integrals using Green's theorem and Stoke's theorem.		
ECC301.5	Students will evaluate integral by comparing with Laplace transform, prove deductions using fourier series, construct analytic function from the linear combination of its real and imaginary parts, evaluate functions of square matrices, identify applications of Green's and Stoke's theorem.		
ECC301.6	Students should be able to develop a program to get fourier series of a function and study the approximation of function by Fourier series.(through mini project)		

Course Name:	Electronic Devices and Circuits		
Course Code	ECC302		
Faculty Name:	Mr. Ankur G.		
Year	2	Sem	III
CO Number	Course Outcome		
ECC302.1	Students will be able to describe the functionality of various electronic devices with applications.		
ECC302.2	Students will be able to explain working of various electronics devices with the help of V-I characteristics.		
ECC302.3	Students will be able to derive expressions for performance parameters of diodes, BJT and MOSFET circuits.		
ECC302.4	Students will be able to evaluate performance of electronic circuits (BJT and MOSFET based).		
ECC302.5	Students will be able to select appropriate circuit for given application.		
ECC302.6	Students will be able to design electronic circuit (BJT, MOSFET based) circuits for given specifications.		

Course Name:	Digital System Design		
Course Code	ECC303		
Faculty Name:	Ms. Poonam Chakraborty		
Year	2	Sem	III

CO Number	Course Outcome
ECC303.1	Students will be able to remember various types of digital logic gates, digital circuits and logic families with examples.
ECC303.2	Students will be able to understand working of various combinational and sequential logic circuits.
ECC303.3	Students will be able to implement various combinational and sequential logic circuits.
ECC303.4	Students will be able to analyze logic circuits.
ECC303.5	Students will be able to evaluate and classify different types of logic circuits.
ECC303.6	Students will be able to simulate and implement combinational and sequential circuits.

Course Name:	Network Theory		
Course Code	ECC304		
Faculty Name:	Freda Carvalho		
Year	2	Sem	III

CO Number	Course Outcome
ECC304.1	The student will be able to learn the basic terminologies related to analysis of electrical circuits, Graph Theory & Two Port Networks.
ECC304.2	The student will be able to describe and identify the different theorems, parameters & terminologies used in the analysis of electrical circuits.
ECC304.3	The student will be able to apply the concepts of electrical circuit theory and compute the transient and steady state response of R, L, C circuits & Two Port Networks.
ECC304.4	The student will be able to analyze the effect of circuit elements on the stability and output characteristics of an electrical network.
ECC304.5	The student will be able to judge and select suitable components in order to make the output of a electrical network stable and in accordance with given requirements.
ECC304.6	The student will be able to design/synthesize electrical circuits as per given specifications.

Course Name:	Electronic Instrumentation and Control Systems		
Course Code	ECC305		
Faculty Name:	Mr. Jayarajesh Vattam		
Year	2	Sem	III

CO Number	Course Outcome
ECC305.1	Students will be able to define and describe the basic terms and characteristics associated with electronic instruments. They will be able to define and describe the basic concepts of control systems.
ECC305.2	Students will be able to explain the principle of operation and discuss about the measurement of electrical and non-electrical parameters using transducers and bridges. The students will be able to understand the purpose of a control system and its usefulness in various applications through examples.
ECC305.3	Students will be able to apply their knowledge to find solutions to problems using transducers and bridges. Students will be able to apply the knowledge of Block diagram reduction and Signal flow graph rules to derive the mathematical model of a control system.
ECC305.4	Students will be able to analyze and compare the various transducers and bridges. They will be able to analyze time domain and frequency domain parameters for a given system using various techniques. They will be able to analyze stability conditions using appropriate criterias.
ECC305.5	Students will be able to evaluate transient and steady state error parameters of a system for different standard test signal.
ECC305.6	Students will be able to create models of different systems through simulation and analyze different parameters.

Course Name:	Electronic Devices and Circuits Lab		
Course Code	ECL301		
Faculty Name:	Mr. Ankur G		
Year	2	Sem	III
CO Number	Course Outcome		
ECL301.1	Students will be able to know various equipments, electronics devices and components, and measuring instruments used to perform laboratory work.		
ECL301.2	Students will be able to explain functionality of various equipments, electronics devices and components and measuring instruments used to perform laboratory work.		
ECL301.3	Students will be able to apply the knowledge to connect various equipments, devices, components and measuring devices using bread board as per the circuit diagram for the experiment to be performed.		
ECL301.4	Students will able to perform experiment to obtain desired input-output waveforms and collect the appropriate data.		
ECL301.5	Students will able to analyze data obtained from experiment to relate theory with experimental results.		
ECL301.6	Students will able to prepare laboratory report (Journal) to summarise the outcome of each experiment.		

Course Name:	Digital System Design Lab		
Course Code	ECL302		
Faculty Name:	Prof. Hemlata Mote, Prof. Poonam C.		
Year	2	Sem	III
CO Number	Course Outcome		
ECL302.1	Students will be able to identify various Digital ICs and basic building blocks of digital system design		
ECL302.2	Students will be able to understand working of by verifying the logical expressions using logic gate ICs.		
ECL302.3	Students will be able to apply their knowledge to construct combinational logic circuits like adder, subtractor, multiplexer, code converters etc.		
ECL302.4	Students will be able to design and implement various types of sequential circuits such as counters, registers		
ECL302.5	Students will be able to analyse basic flip flops to perform the inter conversions.		
ECL302.6	Students will be able to develop the digital logic circuits using VHDL/Verilog basic programming.		

Course Name:	Electronic Instrumentation and Control Systems Lab		
Course Code	ECL303		
Faculty Name:	Dr. Ashwini, Mr. Jayarajesh Vattam		
Year	2	Sem	III
CO Number	Course Outcome		
ECL303.1	Students will be able to simulate and verify the principle and characteristics of various transducers.		
ECL303.2	Students will be able to experimentally demonstrate and measure the values of R,L,C using bridges.		
ECL303.3	Students will be able to simulate and verify the time domain specifications for a given system using open source simulation tool.		
ECL303.4	Students will be able to plot and analyze the time/frequency response of a given system.		
ECL303.5	Students will be able to inspect the stability of a system using various techniques.		

Course Name:	Skill Lab: C++ and Java Programming		
Course Code	ECL304		
Faculty Name:	Mrs. Poonam Chakraborty		
Year	2	Sem	III

CO Number	Course Outcome
ECL304.1	Students will be able to define the object oriented programming concepts of C++ and Java
ECL304.2	Students will be able to interpret building blocks of OOPs language, inheritance, package and interfaces, polymorphism
ECL304.3	Students will be able to demonstrate exception handling methods, string and class method, managing I/O, threading in Java
ECL304.4	Students will be able to select different programming applications using packaging and differentiate between CPP and Java
ECL304.5	Students will be able to summarize multithreading, Applet application programs in object oriented programs.
ECL304.6	Students will be able to anticipate the Utility and applicability of OOP and design an application for the given problem

Course Name:	Mini Project 1A		
Course Code	ECM301		
Faculty Name:	Mr. Ankur, Ms Freda		
Year	2	Sem	III

CO Number	Course Outcome
ECM301.1	Students will be able to identify problems, based on environmental, societal, and sustainable need, to be implemented as a project
ECM301.2	Students will be able to design and simulate the circuit using analog and digital components.
ECM301.3	Students will be able to implement the circuit on breadboard / general purpose printed circuit board (GPP).
ECM301.4	Students will be able to learn soldering, PCB design, and circuit implementation.
ECM301.5	Students will be able to utilize the basic electronic tools and equipments (like DMM, CRO, DSO, etc.) to analyze hardware for any fault and rectify it.
ECM301.6	Students will be able to showcase team work and project demonstration through presentation, poster and report.

Course Name:	Digital Communications		
Course Code	ECC501		
Faculty Name:	Ms.Namita Agarwal		
Year	3	Sem	V

CO Number	Course Outcome
ECC501.1	Students will be able to define the basic concepts of information theory as applied to modern communication systems.
ECC501.2	Students will be able to understand and explain the methods of baseband and bandpass communication.
ECC501.3	Students will be able to apply source coding and channel coding techniques for efficient communication.
ECC501.4	Students will be able to analyze and compare the source coding ,channel coding and digital modulation techniques.
ECC501.5	Students will be able to evaluate the performance of baseband and bandpass systems.
ECC501.6	Students will be able to formulate and design error control systems for reliable communication.

Course Name:	Discrete Time Signal Processing		
Course Code	ECC502		
Faculty Name:	Mr.Jayarajesh Vattam		
Year	3	Sem	V

CO Number	Course Outcome
ECC502.1	Students will be able to define the discrete time signals, systems and their various properties.
ECC502.2	Students will be able to explain the concepts of various tools to be used in analysis of discrete time systems.
ECC502.3	Students will be able to compute various parameters of discrete time systems
ECC502.4	Students will be able to analyze the discrete time systems for measuring the performance of digital filters.
ECC502.5	Students will be able to evaluate the discrete time systems for its better utilization in various applications.
ECC502.6	Students will be able to design the discrete time systems for effective use in various applications.

Course Name:	RSA		
Course Code	ECC504		
Faculty Name:	Dr. Ashwini Kotrashetti		
Year	3		

CO Number	Course Outcome
ECC504.1	To understand the concept of random variables, their applications & random processes.
ECC504.2	To differentiate continuous and discrete random variables and their distributions
ECC504.3	To apply theory of probability in identifying and solving relevant problems.
ECC504.4	To analyze mean, variance, and distribution function of random variables and functions of random variables.
ECC504.5	To analyze linear regression algorithms and apply for predictive applications.
ECC504.6	To evaluate the type of the process and find the response of LTI system for WSS process.

Course Name:	Digital VLSI		
Course Code	ECC503		
Faculty Name:	Dr. Sudhakar Mande		
Year	3	Sem	V

CO Number	Course Outcome
ECC503.1	Students will be able to Know various tools and processes used in VLSI Design (Knowing)
ECC503.2	Students will be able to explain working of various CMOS combinational and sequential circuits (Understanding)
ECC503.3	Students will be able derive expression for performance parameters of various building blocks like CMOS inverter (Applying)
ECC503.4	Students will be able to relate performance parameters with design parameters of VLSI Circuits (Analyzing)
ECC503.5	Students will be able to select suitable circuit and design style of given specifications. (Evaluating)
ECC503.6	Students will be able to design and realize various combinational and sequential circuits for given specifications (Designing)

Course Name:	Data Structure and Algorithms		
Course Code	ECCDLO5014		
Faculty Name:	Ms. Mrudul Arkadi		
Year	3	Sem	V

CO Number	Course Outcome
ECCDLO5014.1	Compare functions using asymptotic analysis and describe the relative merits of worst-, average-, and best-case analysis.
ECCDLO5014.2	Apply various operations on Stack and Queue.
ECCDLO5014.3	Ability to demonstrate the operation of Linked list.
ECCDLO5014.4	Ability to demonstrate and apply Trees & Graph data structures.
ECCDLO5014.5	Become familiar with various Sorting and Searching Algorithms and their performance characteristics.
ECCDLO5014.6	Describe the hash function and concepts of collision and its resolution methods

Course Name:	DCOM LAB		
Course Code	ECL 501		
Faculty Name:	Namita Agarwal		
Year	3	Sem	V

CO Number	Course Outcome
ECL 501.1	Students will have the knowledge about the basic concept of digital communication system.
ECL 501.2	Students will be able to understand and experimentally demonstrate the different digital modulation techniques.
ECL 501.3	Students will be able to compute various parameters for a communication system.
ECL 501.4	Students will be able to simulate various coding techniques and analyze the simulation results.
ECL 501.5	Students will be able to evaluate the performance of a communication system
ECL 501.6	Students will be able to design error control codes as per specifications.

Course Name:	Discrete Time Signal Processing Lab		
Course Code	ECL502		
Faculty Name:	Mr.Jayarajesh Vattam		
Year	3	Sem	V

CO Number	Course Outcome
ECL502.1	Students will be able to know the conditional looping system in programming language
ECL502.2	Students will be able to understand various approaches to be used in analysis of discrete time systems.
ECL502.3	Students will be able to compute various parameters of discrete time systems
ECL502.4	Students will be able to analyze the discrete time systems for measuring the performance of digital filters.
ECL502.5	Students will be able to evaluate the discrete time systems for its better utilization in various applications.
ECL502.6	Students will be able to design the discrete time systems for effective use in various applications.

Course Name:	DVLSI Lab		
Course Code	ECL503		
Faculty Name:	Dr. Sudhakar Mande, Prof. Hemlata Mote		
Year	3	Sem	V
CO Number	Course Outcome		
ECL503.1	Students will be able to write spice code for given combinational and sequential CMOS circuits.		
ECL503.2	Students will be able to perform various analysis like operating point, dc, transient etc of given CMOS circuit		
ECL503.3	Students will be able to evaluate performance of given CMOS circuits.		
ECL503.4	Students will be able to draw layout of given CMOS circuit and also able extract various parasitic using open source layout tool like Magic		
ECL503.5	Students will be able to design, simulate, and verify CMOS circuit for given specifications		

Course Name:	Professional Communication & Ethics - II		
Course Code	ECL504		
Faculty Name:	Prof. Sachin Sugave		
Year	3	Sem	V
CO Number	Course Outcome		
ECL504.1	Students will be able to relate to techniques of formal and technical writing and principles of corporate ethics which includes knowledge of Intellectual Property Rights and ethical codes of conduct in business and corporate activities		
ECL504.2	Students will be able to relate to techniques of formal and technical writing and principles of corporate ethics which includes knowledge of Intellectual Property Rights and ethical codes of conduct in business and corporate activities		
ECL504.3	Students will be able to make use of the techniques for mock interviews and interpersonal skills in presentations		
ECL504.4	Students will be able to compare various forms of technical writing like technical reports, Technical proposals, and Meeting documentation.		
ECL504.5	Students will be able to evaluate technical reports and technical proposals using the given rubric		
ECL504.6	Students will be able to design resumes and Statement of Purpose as per the given format		

Course Name:	Mini Project 2A		
Course Code	ECM501		
Faculty Name:	Aparna Telgote, Laxmi Iyer		
Year	5	Sem	V
CO Number	Course Outcome		
ECM501.1	Students will be able to understand embedded systems with design & BoM metrics.		
ECM501.2	Students will be able to learn about 32 bit microcontrollers and programming in Embedded C.		
ECM501.3	Students will be able to Implement Embedded systems integration with different sensors and peripherals as IoT.		
ECM501.4	Students will be able to Implement Embedded systems with different communication protocols as IoT.		
ECM501.5	Students will be able to Analyze concepts of Real time operating systems.		
ECM501.6	Students will be able to Design embedded system applications using sensors, peripherals and RTOS		

Course Name:	Microwave Engineering		
Course Code	ECC701		
Faculty Name:	Freda Carvalho		
Year	4	Sem	VII
CO Number	Course Outcome		
ECC701.1	Students will have comprehensive knowledge and skills associated to Microwave passive, active components and Microwave integrated circuits		
ECC701.2	Students will develop a capacity to write and explain the theoretical concepts related to Microwave passive & active components.		
ECC701.3	Students will develop the ability to apply knowledge to solve problems and derive equations on working of microwave devices . They will be able to utilise the principles of microwave engineering towards solving problems of microstrip, coupled lines and strip lines.		
ECC701.4	Students will develop the ability to analyse the working of matching networks and modes of waveguides, striplines, microstriplines and coupled lines		
ECC701.5	Students will be able to evaluate the working of impedance matching networks, microwave devices, microwave tubes and semiconductor devices.		
ECC701.6	Students will design a matching network for a microwave subsystem with the given specification		

Course Name:	MCS		
Course Code	ECC702		
Faculty Name:	Aparna T		
Year	4	Sem	VII
CO Number	Course Outcome		
ECC702.1	Students will able to understand GSM, CDMA concepts and architecture, frame structure, system capacity, services provided		
ECC702.2	Students will compare the 1G,2G,3G,4G with respect to data rate, frame structure, modulation schemes used, advantages and limitations		
ECC702.3	Identify the emerging technologies for upcoming mobile communication systems.		
ECC702.4	Students will able to evaluate and analyze various propagation path loss models and their impact on received signal strength.		
ECC702.5	Students will able to simulate live wireless networks and analyze the simulation results		
ECC702.6	Students will able to design a cellular network which will take care of trade off between capacity and signal to Interference ratio		

Course Name:	INTERNET COMMUNICATION ENGG- ELECTIVE		
Course Code	ECCDLO 7033		
Faculty Name:	APARNA T.		
Year	4	Sem	VII
CO Number	Course Outcome		
ECCDLO 7033.1	Students will be able to define various terms related to the internet communication and voice transfer.		
ECCDLO 7033.2	Students will be able to compare OSI and TCP/IP model.		
ECCDLO 7033.3	Students will be able to discuss the functions of the various protocols in use for Internet and voice communication.		
ECCDLO 7033.4	Students will be able to choose the specific protocols for a given application.		
ECCDLO 7033.5	Students will be able to analyse different protocols used in internet communication.		
ECCDLO 7033.6	Students will be able to design various networks and subnetworks used in Internet communication according to specific applications.		

Course Name:	Big Data Analytics		
Course Code	ECCDLO 7014		
Faculty Name:	Mr. Ankur G		
Year	4	Sem	VII
CO Number	Course Outcome		
ECCDLO 7014.1	students will have the basic knowledge of Database Management System		
ECCDLO 7014.2	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.		
ECCDLO 7014.3	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, MapReduce and NoSQL in big data analytics.		
ECCDLO 7014.4	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.		
ECCDLO 7014.5	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc		
ECCDLO 7014.6	Develop applications for Big Data analysis using Hadoop and NoSQL etc.		

Course Name:	Microwave Engineering Laboratory		
Course Code	ECL701		
Faculty Name:	Freda Carvalho		
Year	4	Sem	VII
CO Number	Course Outcome		
ECL 701.1:	Students will have basic knowledge and skills related to Microwave components and will be able to measure various microwave parameter		
ECL 701.2	Students will be able to identify components in the measurement setup and explain their use.		
ECL 701.3	Students will be able to apply their theoretical knowledge and demonstrate proficiency to operate various instruments to measure and analyze various microwave parameters.		
ECL 701.5	Student will be able to evaluate the obtained results and make comparisons of the measurement techniques		
ECL 701.6	Students will be able to design/simulate and evaluate the behaviour of microwave circuits		
ECL 701.4	Student will be able to analyse the obtained results through measurements and make valid conclusions		

Course Name:	Mobile Communication LAB		
Course Code	ECL702		
Faculty Name:	Aparna M. Telgote		
Year	4	Sem	VII
CO Number	Course Outcome		
ECL702.1	Students will be able to find SAR value and various wireless technologies supported by the mobile and will understand generations of mobile phones		
ECL702.2	Students will be able to understand performance characteristics of mobile communication(Frequency Reuse)		
ECL702.3	Students will be able to generate code , and design basic CDMA Transceiver System		
ECL702.4	Students will be able to apply various path loss models (Free space/Indoor propagation model) to find path loss and calculate received signal strength, and coverage distance for different (urban, suburban and rural) environment		
ECL702.5	Students will be able to analyse live network of 2G and 3G and HSDPA network		
ECL702.6	Students will be able to evaluate performance of a cellular system for different environment by considering the effect of Cluster Size, traffic intensity, Signal to Interference ratio.		

Course Name:	Project Stage-I		
Course Code	ECP701		
Faculty name	Ms. Poonam Chakraborty		
Year	4	Sem	VII

CO Number	Course Outcome
ECP701.1	Students will be able to identify the domain area of their project and also the Industrial/social/health/safety/legal/environment aspects.
ECP701.2	Students will be able to apply appropriate research methodologies & design techniques to provide solutions that meet specified needs with consideration for public health, safety & welfare, global cultural, social, environmental and economic factors.
ECP701.3	Students will be able to develop & conduct appropriate experimentation, analyze/ synthesize and interpret data using modern tools to draw valid conclusions.
ECP701.4	Students will be able to function effectively as a team, plan tasks, establish goals and meet objectives.
ECP701.5	Students will be able to demonstrate ethical and professional responsibilities.
ECP701.6	Students will be able to communicate effectively their work through technical reports and presentations.