DON BOSCO INSTITUTE OF TECHNOLOGY, MUMBAI
DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION
Course Outcome 2020-21 (EVEN SEMESTER)

Course Name:	Maths IV		
Course Code	ECC401		
Faculty Name:	Dr. Revathy		
Year	2	Sem	IV
CO Number	Course Outcome		
ECC401.1	Students will be able to (i) Obtain Eigen values and Eigen vectors for a given square matrix (ii) Define Metric spaces (iii) Define Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient		
ECC401.2	Students will be able to (i) Infer properties of Eigen values and Eigen vectors (ii) Show if a given set is a vector space or not (iii) Interpret if a given distance / set is a metric / metric space (iv) Calculate conditional Probabilities using Bayes' theorem (v) Obtain pdf and cdf of discrete and continuous random variables (including special discrete – Binomial and Poisson and special continuous – normal) (vi) Calculate various probabilities of random variables following Binomial Poisson and Normal distributions (vii) Karl-Pearson's Coefficient of Correlation and Spearman's Rank Correlation and regression lines		
ECC401.3	Students will be able to (i) Construct diagonal matrices using the concept of similarity (ii) Build functions of square matrices (iii) Obtain normal and orthogonal forms of Quadratic forms (iv) Obtain extremals of a given integral using the theory of Calculus of variations (v) Evaluate integrals using the different Cauchy's theorems (Integral theorem, Residue theorem) (vi) Obtain Taylor's and Laurent's series (vii) Identify orthogonal vectors and obtain orthonormal basis using Gram-Schmidt process (viii) Use Bayes' theorem to obtain conditional probabilities (x) Obtain MGF and hence obtain the mean and variance (up to first 4 moments) of a random variableObtain probabilities using correct interpretation of Binomial distribution, Poisson and normal approximations to binomial distribution and also Binomial approximation to normal distribution		
ECC401.4	Students will be able to (i) Obtain extremals of a given integral under some constraints using the theory of Calculus of variations (Isoperimetric problems) (ii) Obtain probabilities and z-values for normal distributions		

Course Name:	Micro Controller		
Course Code	ECC-402		
Faculty Name:	Mr. Yogesh		
Year	2	Sem	IV
CO Number	Course Outcome		
ECC402.01	Student will know basic features, architecture and pin configuration of 8051 and ARM7 microcontroller.		
ECC402.02	Student will be able to demonstrate understanding of memory organization, Instruction set, addressing modes, I/O ports, counter/ timer, Interrupts, UART of 8051 and ARM7 microcontroller.		
ECC402.03	Student will be able to apply knowledge of instruction set to write assembly language program for given logic.		
ECC402.04	Student will be able to interface and program peripheral devices LED, LCD, and seven segment displays, Keyboard, ADC and DAC (0808/09), Stepper motor and relay, IR sensor with 8051 and ARM7 microcontroller.		
ECC402.05	Students will analyse input/output interface and demonstrate knowledge via simulation.		
ECC402.06	Student will be able to design microcontroller based system for various application		

Course Name:	Linear integrated Circuits		
Course Code	ECC403		
Faculty Name:	Dr. S S Mande		
Year	2	Sem	IV
CO Number	Course Outcome		
ECC403.1	The student will be able to understand the fundamentals and areas of applications for the linear integrated circuits.		
ECC403.2	The students will be able to identify the concepts to a particular circuit to build a given application in linear integrated circuits		
ECC403.3	The student will be able to analyze important types of linear integrated circuits of day-to-day requirements.		
ECC403.4	The student will be able to evaluate various parameters for any given linear integrated circuits		
ECC403.5	The students will be able to apply the concepts to a particular circuit to build a given application in linear integrated circuits		
ECC403.6	The students will be able to design a circuit for any particular applications in the area of linear integrated circuit.		

Course Name:	SS		
Course Code	ECC404		
Faculty Name:	Freda C		
Year	2	Sem	IV

CO Number	Course Outcome
ECC404.1	Students will be able to learn the mathematical description and representation of continuous and discrete time signals and systems.
ECC404.2	Students will be able to interpret & classify signals & systems based on their different properties.
ECC404.3	Students will be able to apply the Laplace transform and Z- transform to continuous-time and discrete-time signals and determine the response of LTI system using convolution.
ECC404.4	Students will be able to Analyse the spectral characteristics of continuous-time periodic and aperiodic signals using Fourier analysis.
ECC404.5	Students will be able to compare & evaluate the different signal processing algorithms being used for various signal processing applications.
ECC404.6	Students will be able to realize and design recursive and non recursive systems in different forms.

Course Name:	Principles of Communication Engineering		
Course Code	ECC405		
Faculty Name:	Mrs. Namita Agarwal		
Year	2	Sem	IV

CO Number	Course Outcome
ECC405.1	The students will be able to describe the basic components, types of noises and principles of multiplexing techniques in a communication system.
ECC405.2	The students will be able to discuss the different types of modulation and demodulation techniques for analog communication.
ECC405.3	The students will be able to apply their knowledge in obtaining the different performance parameters of a communication system.
ECC405.4	The students will be able to analyze the concepts of Amplitude and Frequency Modulation and Demodulation systems.
ECC405.5	The students will be able to evaluate and compare analog comunication, pulse modulation and multiplexing techniques.
ECC405.6	The students will be able to explore the applications of different modulation techniques and present their work.

Course Name	Principles of Communication Engineering Laboratory		
Course Code	ECL403		
Faculty Name:	Mrs. Namita Agarwal		
Year	2	Sem	IV

CO Number	Course Outcome
ECL403.1	The students will be able to experimentally demonstrate and explain the analog modulation techniques.
ECL403.2	The students will be able to experimentally implement and perform analog and pulse modulation techniques.
ECL403.3	The students will be able to find the different physical parameters of the various modulated signals.
ECL403.4	The students will be able to analyze the waveforms of various types of analog and pulse modulation methods.
ECL403.5	The students will be able to simulate and compare the different modulation techniques

Course Name:	LIC LAB	
Course Code	ECL402	
Faculty Name:	Dr. Mande	
Year	2	Sem IV

CO Number	Course Outcome
ECL402.1	The students will understand the working of various IC , timers and linear integrated circuits
ECL402.2	The students will be able to identify the particular circuit necessary to perform a particular operation
ECL402.3	The students will be able to analyze the working of differerent types of circuits
ECL402.4	The students will be able to evaluate various parameters of the given circuit.
ECL402.5	The students will be able to apply the concepts of the numerous ICs they learn in practical circuits
ECL402.6	The students will be able to design the circuit for a given application

Course Name:	MC LAB	
Course Code	ECL401	
Faculty Name:	Mr. Yogesh	
Year	2	Sem IV

CO Number	Course Outcome
ECL401.1	Student will know basic features, architecture and pin configuration of 8051 and ARM7 microcontroller.
ECL401.2	Student will be able to demonstrate understanding of memory organization, Instruction set, addressing modes, I/O ports, counter/ timer, Interrupts, UART of 8051 and ARM7 microcontroller.
ECL401.3	Student will be able to apply knowledge of instruction set to write assembly language program for given logic.
ECL401.4	Student will be able to interface and program peripheral devices LED, LCD, and seven segment displays, Keyboard, ADC and DAC (0808/09), Stepper motor and relay, IR sensor with 8051 and ARM7 microcontroller.
ECL401.5	Students will analyse input/output interface and demonstrate knowledge via simulation.
ECL401.6	Student will be able to design microcontroller based system for various application

Course Name:	MICROCONTROLLER AND APPLICATION	
Course Code	ECC601	
Faculty Name:	YOGESH G	
Year	3	Sem VI

CO Number	Course Outcome
ECC601.1	Student will know basic features, architecture and pin configuration of 8051 and ARM7 microcontroller.
ECC601.2	Student will be able to demonstrate understanding of memory organization, Instruction set, addressing modes, I/O ports, counter/ timer, Interrupts, UART of 8051 and ARM7 microcontroller.
ECC601.3	Student will be able to apply knowledge of instruction set to write assembly language program for given logic.
ECC601.4	Students will analyse input/output interface and demonstrate knowledge via simulation.
ECC601.5	Student will be able to interface and program peripheral devices LED, LCD, and seven segment displays, Keyboard, ADC and DAC (0808/09), Stepper motor and relay, IR sensor with 8051 and ARM7 microcontroller.
ECC601.6	Student will be able to design microcontroller based system for various application

Course Name:	CCN		
Course Code	ECC602		
Faculty Name:	Mrs. Namita Agarwal		
Year	3	Sem	VI

CO Number	Course Outcome
ECC602.1	Students will be able to define and describe the basic concepts of computer networks
ECC602.2	Students will be able to discuss and explain the services provided, protocols used along with the design issues for each of the layers of computer networks.
ECC602.3	Students will be able to apply various error detection and correction methods along with routing algorithms .
ECC602.4	Students will be able to compare various protocols,multiple access techniques and routing algorithms used in computer networks.
ECC602.5	Students will be able to evaluate the performance of a computer network.
ECC602.6	Students will be able to formulate,design and apply subnet masks and addresses to fulfill networking requirements

Course Name:	AWP		
Course Code	ECC603		
Faculty Name:	Dr. Ashwini K.		
Year	3	Sem	VI

CO Number	Course Outcome
ECC603.1	Student will be able to define and explain Maxwell's equations, various antenna parameters , different propagation effects.
ECC603.2	Student will be able to use Maxwell's equations for derivations of various antennas. They will be able to solve problems on antenna fundamentals
ECC603.3	Student will be able to apply concepts to compare various types of antennas based on the requirements /applications. They will be able to evaluate polarisation, impedance matching effects in antennas.
ECC603.4	Student will be able to analyse the radiation pattern, beamwidth, directivity, null directions for antenna array, yagi and log periodic antenna
ECC603.5	Student will be able to evaluate the given specifications to arrive at the appropriate design/circuit considerations of antennas
ECC603.6	Student will be able to suggest an appropriate design method of antenna system for the given specifications

Course Name:	Image Processing and Machine Vision (IPMV)		
Course Code	ECC604		
Faculty Name:	Dr. Satishkumar S. Chavan		
Year	3	Sem	VI

CO Number	Course Outcome
ECC604.1	Students will be able to know basics of image processing with fundamental processes.
ECC604.2	Students will be able to understand fundamental concepts of formation and sampling of images.
ECC604.3	Students will be able to improve the quality of an image in spatial domain as well as in frequency domain.
ECC604.4	Students will be able to interpret and analyze images in spatial and frequency domain.
ECC604.5	Students will be able to choose appropriate method to reconstruct original image from degraded image.
ECC604.6	Students will be able to design methods for processing images for human interpretation or further processing.

Course Name:	DIGITAL VLSI ELECTIVE		
Course Code	ECCDLO 6021		
Faculty Name:	Dr. S. Mande		
Year	3	Sem	VI

CO Number	Course Outcome
ECCDLO 6021.1	Students will know describe the fundamental understanding of MOSFET
ECCDLO 6021.2	Students will be able to explain and discuss various design styles , memory and storage circuits, data path designs and system level design issues such as protection, clocking, and routing.
ECCDLO 6021.3	Students will be able to apply the concept and derive expressions for various performance measure of digital circuits
ECCDLO 6021.4	Students will be able to analyze the various factors affecting performance measures of digital circuits such as Noise Margins, Propagation delays, power dissipation, and area
ECCDLO 6021.5	Students will be able to compare and select appropriate digital circuit with suitable configuration for given applications
ECCDLO 6021.6	Students will be able to design various building blocks of VLSI circuits to satisfy given specifications

Course Name:	DATABASE MANAGEMENT SYSTEM		
Course Code	ECCDLO 6023		
Faculty Name:	JITHIN ISAAC		
Year	3	Sem	VI

CO Number	Course Outcome
ECCDLO6023.1	Students will be able to understand, define and explain the fundamentals of database management systems.
ECCDLO6023.2	Students will be able to understand the concept of Relational Algebra, Views, Triggers & Transaction Management
ECCDLO6023.3	Students will be able to apply and formulate SQL queries to manage the database system.
ECCDLO6023.4	Students will be able to convert conceptual model to relational model and formulate relational algebra queries.
ECCDLO6023.5	Students will be able to analyze and design a relational database design using the concepts of normalizations.
ECCDLO6023.6	Students will be able to to design the conceptual model of database for any real life problem.

Course Name:	DATABASE MANAGEMENT SYSTEM LABORATORY		
Course Code	ECLDLO 6023		
Faculty Name:	JITHIN ISAAC		
Year	3	Sem	VI

CO Number	Course Outcome
ECLDLO6023.1	Students will be able to learn, apply and formulate SQL queries to create the database system using Data Definition Language
ECLDLO6023.2	Students will be able to learn, apply and formulate SQL queries to manage the database system using Data Manipulation Language
ECLDLO6023.3	Students will be able to Conceptualize and design a GUI Platform incorporating a database at its backend.

Course Name:	MICROCONTROLLER & APPLICATION LAB		
Course Code	ECL601		
Faculty Name:	YOGESH G		
Year	3	Sem	VI

CO Number	Course Outcome
ECL601.1	Student will know basic features, architecture and pin configuration of 8051 and ARM7 microcontroller.
ECL601.2	Student will be able to demonstrate understanding of memory organization, Instruction set, addressing modes, I/O ports, counter/ timer, Interrupts, UART of 8051 and ARM7 microcontroller.
ECL601.3	Student will be able to apply knowledge of instruction set to write assembly language program for given logic.
ECL601.4	Students will analyse input/output interface and demonstrate knowledge via simulation.
ECL601.5	Student will be able to interface and program peripheral devices LED, LCD, and seven segment displays, Keyboard, ADC and DAC (0808/09), Stepper motor and relay, IR sensor with 8051 and ARM7 microcontroller.
ECL601.6	Student will be able to design microcontroller based system for various application

Course Name:	CCN LAB		
Course Code	ECL602		
Faculty Name:	Namita Agarwal		
Year	3	Sem	VI

CO Number	Course Outcome
ECL602.1	Students will be able to explain the various network devices and protocols used at each layer.
ECL602.2	Students will be able to understand and perform various network commands on Linux.
ECL602.3	Students will be able to apply error detection and correction techniques.
ECL602.4	Students will be able to analyze the traffic flow and protocol frames
ECL602.5	Students will be able to simulate and evaluate the performance of a computer network.
ECL602.6	Students will be able to design a computer network as per specific need.

Course Name:	AWP LAB		
Course Code	ECL603		
Faculty Name:	Dr. Ashwini Kotrashetti		
Year	3	Sem	VI

CO Number	Course Outcome
ECL603.1	Students will be able to explain and define various antenna parameters and also explain propagation effects.
ECL603.2	Students will have basic knowledge and skills related to Antenna system and it's testing methods, they will be able to measure various antenna parameters
ECL603.3	Students will be able to apply their theoretical knowledge and demonstrate proficiency to operate various instruments like directional coupler, VNA and software like ANSYS HFSS
ECL603.4	Student will be able to analyse radiation pattern and S11 parameters to compare antennas with respect to certain defined antenna parameters
ECL603.5	Students will be able to investigate inorder to assess the need of adaptation for technological change in the field of antennas
ECL603.6	Student will be able to evaluate given specifications to arrive at appropriate theoretical design of antennas and validate through simulation

Course Name:	Image Processing and Machine Vision Laboratory (IPMV LAB)		
Course Code	ECL604		
Faculty Name:	DR SATISH C		
Year	3	Sem	VI

CO Number	Course Outcome
ECL604.1	Students will be able to understand programming constructs for image processing and machine vision.
ECL604.2	Students will be able to read, modify, display and create images.
ECL604.3	Students will be able to improve the subjective quality of images in spatial domain and frequency domain.
ECL604.4	Students will be able to analyze and interpret the images for machine vision.
ECL604.5	Students will be able to choose appropriate filter to remove the noise.
ECL604.6	Students will be able to design filters for image processing and machine vison.

Course Name:	RF Design Lab
Course Code	ECC801
Faculty Name:	Ms. Freda C.
Year	4	Sem	VIII

CO Number	Course Outcome
ECC801.1	Student will be able to explain concepts related to design of RF filter, Amplifier, Frequency generators, mixers, Frequency synthesisers .
ECC801.2	Student will be able to use stability, gain, noise circle equations,etc to solve problems on design of RF filter, Amplifier, Frequency generators, mixers, Frequency synthesisers.
ECC801.3	Student will be able to apply concepts to compare various types of microwave gain considerations based on the requirements /applications.
ECC801.4	Student will be able to analyse the performance of amplifier,oscillators and Filters using Smith Chart and arrive at a suitable design.
ECC801.5	Student will be able to identify EMI in RF circuits and study of various Electromagnetic Compatibility techniques.
ECC801.6	Student will be able to suggest an appropriate design method of system for the given specifications

Course Name:	Wireless Network
Course Code	ECC802
Faculty Name:	Aparna M. Telgote
Year	4	Sem	VIII

CO Number	Course Outcome
ECC801.1	Student will be able to understand characteristics of communication channel, radio access techniques and multi user detection and specifications of GSM/CDMA technologies.
ECC801.2	Student will be able to compare 2G, 3G and 4G network.
ECC801.3	Students will be able to understand and compare different emerging technologies like Bluetooth, zigbee, Wimax
ECC801.4	Students will be able to give details of sensor network architecture, traffic related protocols , transmission technology etc
ECC801.5	Students will be able to calculate capacity of cellular network of given area.
ECC801.6	Students will be able to evaluate link budget for GSM, CDMA, WCDMA,HSDPA Technologies.

Course Name:	Network Management in Telecommunications(elective)		
Course Code	ECCDLO8044		
Faculty Name:	Poonam Chakraborty		
Year	4	Sem	VIII

CO Number	Course Outcome
ECCDLO8044.1	The students will be able to define the fundamental principles and technical underlying standards in : Telecommunication, Networking and Information Technologies.
ECCDLO8044.2	The students will be able to explain Communications Network Management Systems and their strengths and limitations.
ECCDLO8044.3	The students will be able to model networked informative systems and continuously improve their technological knowledge and communication skills.
ECCDLO8044.4	The students will be able to analyze operation and management of modern data communications networks.
ECCDLO8044.5	The students will be able to compare the way technological change and emerging technologies might alter the assumptions for the underlying architectures systems and management tools.
ECCDLO8044.6	The students will be able to propose the design of Network management model based on the case study.

Course Name:	RF Design Lab		
Course Code	ECL801		
Faculty Name:	Ms. Freda C.		
Year	4	Sem	VIII

CO Number	Course Outcome
ECL801.1	Student will be able to explain concepts related to design of RF filter, Amplifier.
ECL801.2	Student will be able to use stability, gain, noise circle equations,etc to design of RF filter,Oscillators, Amplifier.
ECL801.3	Students will be able to apply their theoretical knowledge and demonstrate proficiency to operate various instruments like directional coupler, VNA and software like GENESYS
ECL801.4	Student will be able to analyse performance of devices using S parameters to with respect to certain defined specifications.
ECL801.5	Students will be able to investigate and Assess current state of research on a topic and also Determine methodologies used in past studies of the same or similar topics
ECL801.6	Students will be able to design/simulate and evaluate the behaviour of microwave circuits

Course Name:	WN-LAB		
Course Code	ECL802		
Faculty Name:	Ms. Aparna T.		
Year	4	Sem	VIII

CO Number	Course Outcome
ECL802.1	Students will able to identify various hardware and software components required in the wireless networks.
ECL802.2	Students will able to demonstrate the configuration of WLAN, WPAN using packet Tracer
ECL802.3	Students will able to calculate the Qos parameter of wireless sensor network
ECL802.4	Students will able to apply uplink and downlink budget analysis for GSM, CDMA, WCDMA and HSPA Technologies
ECL802.5	Students will be able to create wired and wireless scenario using ns2 simulation
ECL802.6	Students will be able to design/write a report on a practical application on wireless network.

Course Name:	NMT-LAB
Course Code	ECLDLO 8044
Faculty Name:	Ms Poonam C
Year	4	Sem	VIII

CO Number	Course Outcome
ECLDLO8044.1	The students will be able to understand the basic tools used for network management, learn some some softwares like CISCO Packet Tracer, Networking tools and commands
ECLDLO8044.2	The students will be able to experiments with basic network status monitoring tools using Linux commands and Packet Sniffer software or command line tools.
ECLDLO8044.3	The students will be able to build various network using Packet Tracer
ECLDLO8044.4	The students will be able to examine the various network behavior for the built network.
ECLDLO8044.5	The students will be able to evaluate various performance parameters from the built network.
ECLDLO8044.6	The students will be able to propose the Management software or network management tool reqired for doing the specific task in an organization.

Course Name:	PROJECT STAGE-II
Course Code	ETP801
Faculty Name:	Ms. Freda C.
Year	4	Sem	VIII

CO Number	Course Outcome
ETP801.1	Students will be able to convert the design into a Product/Model/Prototype and validate the results.
ETP801.2	Students will be able to execute the project plan by working as a team to meet deadlines by maintaining ethics and professional responsibilities.
ETP801.3	Students will be able to present their work effectively through technical presentations, conference/journal publications and technical reports following ethical p