PROGRAM EDUCATIONAL OBJECTIVES

PEO 1: Graduates shall have the ability to apply knowledge across the Branches and in emerging areas of CE/ME/EEE/ECE/CSE/IT for higher studies, research, employability and handle the realistic problems.

PEO 2: Graduates shall have good communication skills, to possess ethical conduct, sense of responsibility to serve the society, and protect the environment.

PEO 3: Graduates shall have strong foundation in academic excellence, soft skills, managerial skills, leadership qualities and understand the need for lifelong learning for a successful professional career.

PROGRAM SPECIFIC OBJECTIVES

PSO 1: After completion of the program the graduate will be able to apply fundamental knowledge of Electronics to design Circuits and to develop the Integrated circuits for various applications in the field of Communication, Signal processing and in System automation

PSO 2: After completion of the program the graduate will be able to develop product by using Electronics Engineering related cutting edge software and hard ware tools

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics natural science, and engineering sciences.
3. **Design / development of solutions:** Design solutions for complex engineering problems and design system components or process that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, society and environmental consideration.
4. **Conduct Investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethics principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in an team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

GURU NANAK INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATIONENGINEERING

COURSE OUTCOMES

PROGRAMME: **B.TECH**	DEGREE: **UG**	A.Y: **2019-20**	SEMESTER: **I&II**

S.No	Year/Sem	Course Name	Course Outcomes (Student will be able to understand)
1	I-I	**Mathematics-I**	**CO1:** Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
			CO2: Reduce the quadratic form to canonical form using orthogonal transformations. Analyse the nature of sequence and series
			CO3: Solve the applications on the mean value theorems. Evaluate the improper integrals using Beta and Gamma functions.
			CO4: Find the extreme values of functions of two variables with/ without constraints
2	I-I	**Applied Physics**	**CO1:** The student would be able to learn the fundamental concepts on Quantum behaviour of matter in its micro state.
			CO2: The knowledge of fundamentals of Semiconductor physics, Optoelectronics, Lasers and fibre optics enable the students to apply to various systems like communications, solar cell, photo cells and so on.
			CO3: Design, characterization and study of properties of material help the students to prepare new materials for various engineering applications.
			CO4: The course also helps the students to be exposed to the phenomena of electromagnetism and also to have exposure on magnetic materials and dielectric materials.
3	I-II	**Programming For Problem Solving**	**CO1:** Demonstrate the basic knowledge of computer hardware and software.
			CO2: Ability to write algorithms and draw flow charts for solving problems.
			CO3 Ability to code a given logic in C programming language.
			CO4: Implementing different searching and sorting techniques for problem solving.
4	I-I	**Engineering Graphics**	**CO1:** Preparing working drawings to communicate the ideas and information.
			CO2: Read, understand and interpret engineering drawings.
			CO1 The knowledge of atomic, molecular and electronic

5	I-II	**Chemistry**	changes, band theory related to conductivity
			CO2: The required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
			CO3 The required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
			CO4: The knowledge of configurational and conformational analysis of molecules and reaction mechanisms.
6	I-II	**English**	**CO1:** Use English Language effectively in spoken and written forms.
			CO2: Comprehend the given texts and respond appropriately.
			CO3: Communicate confidently in various contexts and different cultures.
			CO4: Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.
7	I-II	**Basic Electrical Engineering**	**CO1:** Students will be able to analyze the basic concepts like ohms law, KCL, KVL, for different electrical networks and apply them to other networks reduction techniques.
			CO2: Students will be able to distinguish between AC and DC, demonstrate terminology used in AC Circuits, and able to know the advantages and applications of AC Circuits.
			CO3: Students will be able to explain in detail about Transformers.
			CO4: Students will be able to distinguish between different types of DC/AC machines
			CO5: Students will be obtaining knowledge of various electrical installations.
8	I-II	**Mathematics-II**	**CO1**: Identify whether the given differential equation of first order is exact or not.
			CO2: Solve higher differential equation and apply the concept of differential equation to real world problems.
			CO3: Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelepiped
			CO4: Evaluate the line, surface and volume integrals and converting them from one to another.
9	II-I	Electronic Devices And Circuits	**Co1:** Student Will Be Able To Understands The Concept Of Diode And Its Application
			CO2: Student Will Be Able To Exposes Towards BJT And Design Approaches Using Load Line Analysis
			CO3: Student Will Be Able To Understanding Concept Of JFET

			CO4: Student Will Be Able To Understands Small Signal BJT Analysis
10	**II-I**	Network Analysis And Transmission Lines	**Co1:** Apply And Assess The Gained Knowledge On Basic Rlc Circuit's Behavior
			CO2: Analyze The Steady State And Transient Analysis Of RLC Circuits
			CO3: Know The Characteristics Of Two Port Network Parameters.
			CO4: Justify And Analyze The Transmission Line Parameters And Configurations
11	**II-I**	Digital System Design	**Co1:** Student Will Understands The Numerical Information In Different Forms And Boolean Algebra Theorems
			CO2: Student Will Be Exposed To The Postulates Of Boolean Algebra And To Minimize Combinational Functions
			CO3:. Student Will Be Able To Design And Analyze Combinational And Sequential Circuits
			CO4: Student Will Known About The Logic Families And Realization Of Logic Gates.
12	**II-I**	Signals And Systems	**Co1:** Students Will Able To Differentiate Various Signal Functions.
			CO2: Students Will Able To Represent Any Arbitrary Signal In Time And Frequency Domain
			CO3: Students Will Able To Understand The Characteristics Of Linear Time Invariant Systems
			CO4: Students Will Able To Analyze The Signals With Different Transform Technique
13	**II-I**	Probability Theory And Stochastic Processes	**Co1:** Students Will Able To Have The Basic Understanding Of Random Signals And Processes.
			CO2: Students Will Able To Utilize The Random Signals And Systems In Communications And Signal Processing Areas
			CO3: Students Will Able To Know The Spectral And Temporal Characteristics Of Random Process.
			CO4: Students Will Able To Learn The Basic Concepts Of Noise Sources
14	**II- I**	Constitution Of India	**Co1** The Scheme Of The Fundamental Duties And Its Legal Status
			CO2: Scheme Of The Fundamental Rights
15	**II-II**	**Laplace Transforms, Numerical Methods And Complex Variables**	Co1: A Student Can Analyze The Complex Functions With Reference To Their Analyticity, Integration Using Cauchy's Integral Theorem
			CO2: Student Can Express A Non-Periodic Function As Integral Representation
			CO3: Express Any Periodic Function In Term Of

			Sines And Cosines
			CO4: Express A Non-Periodic Function As Integral Representation. To Analyze One Dimensional Wave And Heat Equation
16	II-II	**Electromagnetic Fields And Waves**	**Co1:** Students Will Be Able To Distinguish Between The Static And Time-Varying Fields, Establish The Corresponding Sets Of Maxwell's Equations And Boundary Conditions, And Use Them For Solving Engineering Problems
			CO2: Students Will Be Able To Distinguish Scalar And Magnetic Potentials And Will Be Able To Know The Ampere's Law And Its Applications And Can Study The Magnetic Effect On Other Current Sources
			CO3: Students Will Be Able To Understand The Inconsistency Of Ampere's Law And How To Overcome This.
			CO4: Students Will Be Able To Determine The Transmission Line Parameters For Different Lines, Characterize The Distortions And Estimate The Characteristics For Different Lines.
17	II-II	**Analog And Digital Communications**	**Co1:** Students Will Be Able To Analyze And Design Of Various Continuous Wave And Angle Modulation And Demodulation Techniques
			CO2: Students Will Be Able To Understand The Effect Of Noise Present In Continuous Wave And Angle Modulation Techniques
			CO3: Students Will Attain The Knowledge About AM , FM Transmitters And Receivers
			CO4: Students Will Be Able To Analyze And Design The Various Pulse Modulation Techniques Efficiency
18	II-II	**Linear Ic Applications**	**Co1:**. A Thorough Understanding Of Operational Amplifiers With Linear Integrated Circuits
			CO2. A Thorough Understanding Of Operational Amplifiers With Linear Integrated Circuit
			CO3:. Attain The Knowledge Of Functional Diagrams And Applications Of IC 555 And IC 565
			CO4:. Attain The Knowledge Of Functional Diagrams And Applications Of IC 555 And IC 565
			CO5: Acquire The Knowledge About The Data Converters. Understand The Concepts Of Digital Modulation Techniques And Baseband Transmission**.**
19	II-II	**Electronic Circuit**	**CO1:** Learn The Concepts Of High Frequency Analysis Of Transistors

		Analysis	**CO2:**. To Give Understanding Of Various Types Of Amplifier Circuits Such As Small Signal, Cascaded,Large Signal And Tuned Amplifiers
			CO3: To Familiarize The Concept Of Feedback In Amplifiers So As To Differentiate Between Negative And Positive Feedback.
			CO4:. To Construct Various Multivibrators Using Transistors And Sweep Circuits.
20	II-II	**Gender Sensitization**	**Co1:** To Develop Students' Sensibility With Regard To Issues Of Gender In Contemporary India
			CO2: To Provide A Critical Perspective On The Socialization Of Men And Women
			CO3: To Expose The Students To Debates On The Politics And Economics Of Work
			CO4: To Help Students Reflect Critically On Gender Violence.
21	III-I	**Electromagnetic Theory And Transmission Lines**	**CO1:** Students will be able to Apply Maxwell's equations to stationary and time-harmonic fields.
			CO2: Students will be able to Characterize uniform plane waves in free space and different types of media
			CO3: Students will be able to Solve problems of wave reflection and transmission at interfaces and the concepts of propagation of guided waves, power flow by poynting's theorem and applications
			CO4: Students will be able to Competent enough to learn subjects like antennas, microwave engineering, radar systems and wireless communication and research activities can be pursued with knowledge
22	III- I	**Linear And Digital Ic Application**	**CO1:** Students will be able to understand the operational amplifier with linear integrated circuits
			CO2: Students will be able to Understand different families of digital integrated circuits and their characteristics
			CO3: Student will be able to design circuits using operational amplifiers of various applications
23	III- I	**Digital Communication**	**CO1:** Students will be able to describe the functions of various components of digital communication systems
			CO2: Students will be able to compare different pulse digital modulation techniques like PCM, DPCM, DM and ADM.
			CO3: Students will be demonstrating the ability to design digital communication system for a given specifications
			CO4: Students will be able to analyze performance of baseband and pass band digital communication system in terms of error probability and spectral efficiency
			CO5: Students will be demonstrating the ability to describe function of error detecting and error correcting codes like block codes and convolution codes
			CO6: Students will be able to explain the advantages of

			spread spectrum techniques and performance of spread spectrum, PN codes in jamming, noise etc.
24	III- I	**Electronic Measurements And Instrumentation**	**CO1:** Student will be able to explain the fundamental concepts and principles of instrumentation
			CO2: Student will be able to demonstrate the operations of the various instruments required in measurements
			CO3: Student will be able to Apply the measurement techniques for different types of tests. To select specific instrument for specific measurement function.
			CO4: Student will be able to explain the principle of operation, working of different electronic instruments like digital multi meter, vector voltmeter
			CO5: Student will be able to apply knowledge of different oscilloscopes like CRO, DSO
			CO6:Student will be able to functioning, specification, and applications of signal analyzing instruments
25	III-I	**Fundamentals Of Management**	**CO1:** Students will be able to understand management and its evolution
			CO2: Students will be able to plan and control the HR function better
			CO3: Students will be able to plan an organizational structure for a given context in the organization
			CO4: Students will be able to understand various leadership styles
			CO5: Evolving strategies for controlling the business organization effectively
26	III- II	**Java Programming**	**CO1:** Students can apply object oriented concept for writing simple programs.
			CO2: Students can able to apply the exception handling technique for writing user defined exceptions in program.
			CO3: Students can able to connect to database from java program through JDBC.
			CO4: Students can able to write GUI based program by using applet.
27	III- II	**Digital System Design**	**CO1:** Students will Able to Understand and design Embedded Systems.
			CO2: Students will Able to Understand types of memory and interfacing to external world.
			CO3: Students will Able to Learn basic OS and RTOS
			CO4: Students will Able to Understand embedded firmware design approaches
28	III- II	**Antennas And Wave Propagation**	**CO1:** Students able to aware of the parameter considerations viz. antenna efficiency, beam efficiency radiation resistance etc.. in the design of an antenna.
			CO2: Students capable to analyze the designed antenna and field evaluation under various conditions and formulate the

			electric as well as the magnetic fields equation set for Far field and near field conditions.
			CO3: Students able to understand the array system of different antennas and field analysis under application of different currents to the individual antenna elements.
			CO4: Students able to understand the design issues, operation of fundamental antennas like yagi – Uda, Horn antennas and helical structure and also their operational methodology in practice and knowledge about the means of propagation of EM wave.
29	III- II	**Microprocessor And Microcontroller**	**CO1:** Students will learn the internal organization and instruction set of 8086, 8051 microprocessor /microcontrollers and will be able to write programs and execute them based on instruction set.
			CO2: Students able to understand various Data transfer schemes, interrupt structures of 8086 and 8051.
			CO3: Students able to interface various I/O peripherals with 8086 microprocessor, 8051 microcontroller.
			CO4: Students will be able to design a system based on microprocessors/microcontrollers.
30	III- II	**Digital Signal Processing**	**CO1:** Students will able to implement discrete Fourier Transforms (DFT) and Fast Fourier Transform (FFT) to analyze the input signal and design a processing system to give the desired output in the design of a DSP system
			CO2: Students will able to use FFT algorithms in rapid frequency-domain analysis and processing of digital signals and investigation of digital systems.
			CO3: Students will able to design IIR filters to meet specific magnitude and phase requirements
			CO4: Students will able to design FIR filters to meet specific magnitude and phase requirements
			CO5: Students will able to realize IIR and FIR filters using direct forms, cascade and parallel forms
31	IV-I	**Optimization Techniques**	**CO1:** Students will be able to Formulate optimization problems.
			CO2: Students will able apply unconstrained optimization and constrained non-linear programming and dynamic programming
			CO3: Students will able to explain the need of optimization of engineering systems
			CO4: Students will able to understand optimization of electrical and electronics engineering problems
			CO5: Students will able to apply classical optimization techniques, linear programming, simplex algorithm, transportation problem,
	IV-I	**Microwave**	**CO1:** Students will able to Describe the significance of microwaves and transmission lines

32		**Engineering**	**CO2**: Students will able to Analyze the characteristics of microwave tubes and compare them
			CO3: Students will able to List and explain the various microwave solid state devices
			CO4: Students will able to Set up a microwave bench for measuring microwave parameters
33	IV-I	**Computer Networks**	**CO1:** Students will be able to analyze Data communications System and its components
			CO2: Students will be able to Identify the different types of network topologies and protocols
			CO3: Students will be able to Enumerate the layers of the OSI model and TCP/IPL Explain the function(s) of each layer
			CO4: Students will be able to build the skills of sub netting and routing Mechanisms
34	IV-I	**Vlsi Design**	**CO1:** Student will be able to Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors.
			CO2: Student will be able to Choose an appropriate inverter depending on specifications required for a circuit
			CO3: Student will be able to Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
			CO4: Student will Design different types of logic gates using CMOS inverter and analyze their transfer characteristics
35	IV-I	**Embedded Systems Design**	**CO1:** Students will be Able to Understand and design Embedded Systems
			CO2: Students will be Able to Understand types of memory and interfacing to external world
			CO3: Students will be Able to Learn basic OS and RTOS
			CO4: Students will be Able to Understand embedded firmware design approaches
36	IV-II	**Global Positioning System**	**CO1:** Student will have an overview w, Satellite Navigation, Time and GPS, User position and velocity calculations
			CO2: Student will be able to use GPS in surveying.
			CO3: Student will be able to design satellite links
37	IV-II	**Optical Communications**	**CO1:** Student will be able Understand and analyze the constructional parameters of optical fibres.
			CO2: Students will be able to design an optical system..
			CO3: Students will be able to Estimate the losses due to attenuation, absorption, scattering and bending.
			CO4: Students will be able to Compare various optical detectors and choose suitable one for different applications.