STUDENT HANDBOOK

Prepared By :
Electronics and Communication Department

VISION OF THE INSTITUTE

To evolve as an eminent Centre of Learning with total commitment to provide career-focused technical training aimed at excellence in inter-disciplinary education, research and innovation in order to produce socially responsible and synergetic leaders with a global profile.

MISSION OF THE INSTITUTE

The Baba Banda Singh Bahadur Engineering College seeks to enrich the academic experience of students to help them meet the evolving needs of society. We aspire to realise our Vision as follows:

- Conduct UG programs that integrate global awareness, communication skills and team building across the curriculum.
- Run Graduate education programs to prepare students for inter-disciplinary engineering research and advanced problem solving with focus on career advancement.
- Provide an atmosphere to facilitate personal commitment to the educational success of students in an environment that values diversity and community
- Inculcate a high regard for ethical principles and an understanding of human and environmental realities.
- Provide state-of-the-art facilities and effective delivery of high quality content by qualified faculty members to build the notion of lifelong learning.
- Conduct scholarly activities that create and transfer cutting-edge knowledge in the area of engineering and technology
- Create a highly successful alumni base that contributes to the global society.

Vision of The Department

To impart quality technical education in the field of electronics and communication engineering to produce innovative technocrats that are technically competent and professionally ethical to contribute towards Indian and global future industrial requirements.

Mission of The Department

- To provide high quality education to the students for a successful professional career in the field of electronics and communication engineering.
- To provide an environment for promoting innovation, team-work and leadership qualities among the students.
- To expose our students to the latest technologies in ECE so as to make them meet the growing challenges of the industry.
- To inculcate ethical and value-based perception among students so that they can provide holistic solutions to future challenges.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- To develop the technical skills and competence among our students to contribute towards sustainable development of electronics and communication engineering.
- To inculcate in our students the curiosity for lifelong learning so that they pursue higher studies and contribute to research and development in electronics and allied fields.
- To groom our students into ethical and socially responsible electronics engineers who can work as team members as well as leaders in multicultural and multidisciplinary groups.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- Able to understand the various software and hardware aspects of electronic systems
- Able to use techniques, skills and modern engineering tools to design, implement and evaluate electronic systems in your job and/or continued education.
- Able to apply mathematical concepts and algorithmic principles to solve computational and real-world problems in your job and/or continued education.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 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.
- 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.
- 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.
- 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.
- Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 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.
- 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 a team, to manage projects and in multidisciplinary environments.
    - 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 technology.

STUDY SCHEME

First Semester									
NAAC Code	Course Code	Course Name	Load Allocation			Marks Distribution			Credits
			L	T	P	Internal	External	Total	
ECE101	BTPH101-23	Physics	3	1	0	40	60	100	4
ECE102	BTPH102-23	Physics (Lab)	0	0	2	30	20	50	1
ECE103	BTAM101-23	Engineering Mathematics-I	3	1	0	40	60	100	4
ECE104	BTEE101-18	Basic Electrical Engineering	3	1	0	40	60	100	4
ECE105	BTEE102-18	Basic Electrical Engineering (Lab)	0	0	2	30	20	50	1
ECE106	BTME101-21	Engineering Graphics & Design	1	0	4	40	60	100	3
ECE107	BMPD101-18	Mentoring and Professional Development	0	0	2	Satisfactory / Un-satisfactory			Non-Credit
	Total		**10**	**3**	**10**	**220**	**280**	**500**	**17**

Second Semester									
NAAC Code	Course Code	Course Name	Load Allocation			Marks Distribution			Credits
			L	T	P	Internal	External	Total	
ECE108	BTCH101-23	Chemistry-I	3	1	0	40	60	100	4
ECE109	BTCH102-18	Chemistry-I (Lab)	0	0	2	30	20	50	1
ECE110	BTAM201-23	Engineering Mathematics-II	3	1	0	40	60	100	4
ECE111	BTPS101-18	Programming for Problem Solving	3	0	0	40	60	100	3
ECE112	BTPS102-18	Programming for Problem Solving (Lab)	0	0	4	30	20	50	2
ECE113	BTMP101-18	Workshop / Manufacturing Practices	1	0	4	60	40	100	3
ECE114	BTHU101-18	English	2	0	0	40	60	100	2
ECE115	BTHU102-18	English (Lab)	0	0	2	30	20	50	1
ECE116	BMPD201-18	Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
		Total	**12**	**2**	**14**	**290**	**360**	**650**	**20**

Third Semester										
NAAC Code	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total**	**Credits**
ECE217	BTEC- 301-18	Electronic Devices	3	0	0	3	40	60	100	3
ECE218	BTEC- 302-18	Digital System Design	3	1	0	4	40	60	100	4
ECE219	BTEC- 303-18	Electromagnetic Waves	3	1	0	4	40	60	100	4
ECE220	BTEC-304-18	Network Theory	3	1	0	4	40	60	100	4
ECE221	BTAM-303-23	Mathematics III (Integral Transforms, Probability & Statistics)	3	1	0	4	40	60	100	4
ECE222	BTEC-311-18	Electronic Devices Laboratory	0	0	2	2	30	20	50	1
ECE223	BTEC-312-18	Digital System Design Laboratory	0	0	2	2	30	20	50	1
ECE224	HSMC101-18 /HSMC102-18*	Foundational Course in Humanities (Development of Societies or Philosophy)	3	0	0	3	40	60	100	3
ECE225	BTEC-321-18	4-Week Institutional Training	0	0	4	3	40	60	100	0
ECE226	BMPD-331-18	Mentoring and Professional Development	0	0	2	Satisfactory/Un-satisfactory				Non-credit
		Total	**19**	**4**	**10**	**32**	**360**	**440**	**800**	**24**

Fourth Semester										
NAAC Code	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total Marks**	**Credits**
ECE227	BTEC-401-18	Analog Circuits	3	1	0	4	40	60	100	4
ECE228	BTEC-402-18	Microprocessors and Microcontrollers	3	1	0	4	40	60	100	4
ECE229	BTCS-301-18	Data Structures & Algorithms	3	0	0	3	40	60	100	3
ECE230	BTEC-403-18	Signals and Systems	3	1	0	4	40	60	100	4
ECE231	HSMC122-18	Universal Human Values – 2: Understanding Harmony	3	0	0	3	40	60	100	3
ECE232	EVS-101-18	Mandatory Course- Environmental Sciences	3	0	0	3	100	0	100	Non-credit
ECE233	BTEC-411-18	Analog Circuits Laboratory	0	0	2	2	30	20	50	1
ECE234	BTEC-412-18	Microprocessors and Microcontrollers Laboratory	0	0	2	2	30	20	50	1
ECE235	BMPD-341-18	Mentoring and Professional Development	0	0	2	Satisfactory/Un-satisfactory				Non-credit
		Total	**18**	**2**	**6**	**26**	**360**	**340**	**700**	**20**

Fifth Semester										
NAAC Code	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total**	**Credits**
ECE336	BTEC- 501-18	Analog and Digital Communication	3	1	0	4	40	60	100	4
ECE337	BTEC-502-18	Digital Signal Processing	3	1	0	4	40	60	100	4
ECE338	BTEC-503-18	Linear Integrated Circuits	3	1	0	4	40	60	100	4
ECE339	BTEC-504-18	Control Systems	3	1	0	4	40	60	100	4
ECE340	BTEC-901X-18	Professional Elective-1	3	0	0	3	40	60	100	3
ECE341	BTEC-505-18	Project Management	3	0	0	3	40	60	100	3
ECE342	BTEC-511-18	Analog and Digital Communication Laboratory	0	0	2	2	30	20	50	1
ECE343	BTEC-512-18	Digital Signal Processing Laboratory	0	0	2	2	30	20	50	1
ECE344	BTEC-513-18	Linear Integrated Circuits Laboratory	0	0	2	2	30	20	50	1
ECE345	BTEC-521-18	4--Weeks Industrial Training	0	0	6	6	60	40	100	0
ECE346	BTEC-10X-18	Professional Elective-1 Lab (Optional)	0	0	2	Satisfactory/Un-Satisfactory				Non-Credit
ECE347	BMPD-351-18	Mentoring and Professional Development	0	0	2	Satisfactory/Un-Satisfactory				Non-Credit
		Total	**18**	**3**	**17**	**38**	**390**	**460**	**850**	**25**

Sixth Semester										
NAAC Code	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total Marks**	**Credits**
ECE348	BTEC-601-18	Wireless Communication	3	0	0	3	40	60	100	3
ECE349	BTCS-504-18	Computer Networks	3	0	0	3	40	60	100	3
ECE350	BTEC-602-18	Optical Fibers & Communication	3	1	0	4	40	60	100	4
ECE351	BTEC-603-18	Microwave and Antenna Engineering	3	1	0	4	40	60	100	4
ECE352	BTEC-906X-18	Professional Elective-2	3	0	0	3	40	60	100	3
ECE353	BTEC-XXX-18	Open Elective-1	3	0	0	3	40	60	100	3
ECE354	BTEC-611-18	Optical Fibers & Communication Lab	0	0	2	2	30	20	50	1
ECE355	BTEC-612-18	Microwave and Antenna Engineering Lab	0	0	2	2	30	20	50	1

ECE356	BTEC-631-18	Project-1	0	0	3	3	60	40	100	3
ECE357	BTEC-11X-18	Professional Elective-2 Lab (Optional)	0	0	2	Satisfactory/Un-satisfactory				Non-credit
ECE358	BMPD-361-18	Mentoring and Professional Development	0	0	2	Satisfactory/Un-satisfactory				Non-credit
		Total	**18**	**2**	**11**	**31**	**360**	**440**	**800**	**25**

Seventh Semester

NAAC Code	Course code	Course Title	L	T	P	Hrs	Internal Marks	External Marks	Total	Credits
ECE459	BTEC- 907X-18	Professional Elective-3	3	0	0	3	40	60	100	3
ECE460	BTEC-908X-18	Professional Elective-4	3	0	0	3	40	60	100	3
ECE461	BTEC-909X-18	Professional Elective-5	3	0	0	3	40	60	100	3
ECE462	BTEC-YYY-18	Open Elective-2	3	0	0	3	40	60	100	3
ECE463	BTEC-ZZZ-18	Open Elective-3	3	0	0	3	40	60	100	3
ECE464	BTMC-101-18	Indian Constitution Mandatory Course	3	0	0	3	100	0	100	Non-Credit
ECE465	BTMC-102-18	Essence of Indian Traditional Knowledge-Mandatory Course	3	0	0	3	100	0	100	Non-Credit
ECE466	BTEC-731-18	Project-II & Report	0	0	12	12	120	80	200	6
ECE467	BTEC-12X-18	Professional Elective-3, 4, 5 Lab (Optional)	0	0	2	Satisfactory/Un-Satisfactory				Non-Credit
ECE468	BMPD-371-18	Mentoring and Professional Development	0	0	2	Satisfactory/Un-Satisfactory				Non-Credit
		Total	**21**	**0**	**16**	**37**	**520**	**380**	**900**	**21**

Eighth Semester

NAAC Code	Course code	Course Title	Internal Marks	External Marks	Total	Credits
ECE469	BTEC- 801-18	Semester Software/Industrial Training & Project	300	200	500	16
		Total	**300**	**200**	**500**	**16**
Total Marks (Including B.Tech 1st Year)			**2680**	**3020**	**5700**	**169**

Course Outcomes
Semester: 1st/2nd

Course: Engineering Physics; Semester: 1st/2nd	
Course Code:- BTPH 101-23	**NAAC Code:- ECE-101**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Acquire knowledge about the Maxwell equation and Electromagnetic spectrum.
II	Understand the working, properties and characterization techniques of semiconductor materials and devices.
III	Appreciate the need for quantum mechanics, wave particle duality, uncertainty principle etc. and their applications.
IV	Understand the properties and synthesis of nanomaterials.
V	Understand laser system, optical fibre in industries, laboratories and in communication.

Course: Engineering Physics Lab; Semester: 1st/2nd	
Course Code:- BTPH 102-23	**NAAC Code:- ECE-102**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Able to verify some of the theoretical concepts learnt in the theory courses.
II	Trained in carrying out precise measurements and handling sensitive equipment.
III	Introduced to the methods used for estimating and dealing with experimental uncertainties and systematic errors.
IV	Learn to draw conclusions from data and develop skills in experimental design.
V	Write a technical report which communicates scientific information in a clear and concise manner.

Course: Engineering Mathematics-I; Semester: 1st	
Course Code:- BTAM101-18	**NAAC Code:-ECE-103**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be:
I	able to verify some of the theoretical concepts learnt in the theory courses.
II	trained to visualize and conceptualize the engineering problems.
III	to model the engineering problem mathematically using theory of calculus.
IV	learn to draw conclusions from data and develop skills in industrial problems.
V	to determine the solution of the studied engineering problem from application point of view.

Course: Basic Electrical Engineering; Semester: 1st/2nd	
Course Code:- BTEE-101-18	**NAAC Code:- ECE-104**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Have the knowledge of DC circuits, AC Circuits, basic magnetic circuits, working principles of electrical machines, and components of low voltage electrical installations.
II	Be able to analyze of DC circuits, AC Circuits.
III	Understand the basic magnetic circuits and apply it to the working of electrical machines.
IV	Be introduced to types of wiring, batteries, and LT switchgear.

Course: Basics of Electrical Engineering Laboratory; Semester: 1st/2nd	
Course Code:- BTEE-102-18	**NAAC Code:- ECE-105**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	The ability to use common electrical measuring instruments and understand the fundamentals of electrical engineering.
II	The ability to make electrical connections and measure power, power factor using appropriate equipments.
III	Have the knowledge of electrical machines, components and their ratings.
IV	Understand the operation of transformers and electrical machines.

Course: Engineering Graphics & Design; Semester: 1st/2nd	
Course Code: BTME101-21	**NAAC Code:-ECE-106**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Prepare and understand drawings.
II	Use the principles of orthographic projections.
III	By studying about projections of solids, students will be able to visualize three dimensional objects and that will enable them to design new products.
IV	Design and fabricate surfaces of different shapes.
V	Represent the objects in three dimensional appearances.

Course: Chemistry-I; Semester: 1st/2nd	
Course Code:- BTCH101-23	**NAAC Code:- ECE-108**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
II	Rationalise bulk properties and processes using thermodynamics, periodic properties such as ionization potential, electronaffinity etc.
III	Distinguish the ranges of the electromagnetic spectrum used in various spectroscopic techniques.
IV	Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
V	List major chemical reactions that are used in the synthesis of molecules.

Course: Chemistry Lab-I ; Semester: 1st/2nd	
Course Code: BTCH102-18	**NAAC Code:- ECE-109**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Estimate rate constants of reactions from concentration of reactants/products as a function of time
II	Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc
III	Synthesize a small drug molecule and analyse a salt sample

Course: Mathematics-II; Semester: 2nd	
Course Code: BTAM201-23	**NAAC Code:-ECE-110**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	able to verify some of the theoretical concepts learnt in the theory courses.
II	trained to visualize and conceptualize the engineering problems.
III	to model the engineering problem mathematically using theory of matrices, ODE and PDE
IV	learn to draw conclusions from data and develop skills in industrial problems.
V	to determine the solution of the studied engineering problem from application point of view.

Course: Programming for Problem Solving; Semester: 1st/2nd	
Course Code:- BTPS101-18	**NAAC Code:- ECE-111**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Describe algorithm, pseudo codes and programming structures.
II	Use syntax, semantics and different constructs to solve mathematical and logical problems in 'C' language.
III	Implement programs related to simple numerical method problems, namely root finding of function, differentiation of function and simple integration in 'C' language.
IV	Identify the role of simple data structures, pointers, memory allocation and data handling for various applications through files in 'C'.
V	Decompose a problem into functions and synthesize a complete program using divide and conquer approach.
VI	Describe various file related operations.

Course: Programming for Problem Solving Lab; Semester: 1st/2nd	
Course Code:- BTPS102-18	**NAAC Code:- ECE-112**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Understand the various hardware and software parts of computer system and define the basic working of Operating System.
II	Describe syntax, semantics and different constructs to solve mathematical and logical problems in 'C' language
III	Implement a simple program by writing the code, testing the code and debugging the program in 'C' Language.
IV	Represent data in arrays, strings and structures and manipulate them through a program.
V	Declare pointers of different types and use them in defining self referential structures.
VI	Implement programs to create, read and write to and from simple text files.

Course: Workshop/Manufacturing Practice; Semester: 1st/2nd	
Course Code:- BTMP101-18	**NAAC Code:-ECE-113**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Upon completion of this laboratory course, students will be able to fabricate components with their own hands.
II	They will also get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
III	By assembling different components, they will be able to produce small devices of their interest.

Course: English; Semester: 1st/2nd	
Course Code:- BTHU-101-18	**NAAC Code:- ECE-114**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	The objective of the course is to help the students become the independent users of English language.
II	Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.
III	Students will be able to understand spoken and written English language, particularly the language of their chosen technical field.
IV	They will be able to converse fluently.
V	They will be able to produce on their own clear and coherent texts.

Course: English-Lab; Semester: 1st/2nd	
Course Code:- BTHU-102-18	**NAAC Code:- ECE-115**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	The objective of the course is to help the students become the independent users of English language.
II	Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.
III	Students will be able to understand spoken and written English language, particularly the language of their chosen technical field.
IV	They will be able to converse fluently.
V	They will be able to produce on their own clear and coherent texts.

Course Outcomes
Semester: 3rd

Course: Electronic Devices		
Course Code:- BTEC-301-18		NAAC Code:-ECE-217
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand physics of semiconductors and behavior of charge carriers within semiconductors	
II	Understand the working of semiconductor diodes supported with mathematical explanation.	
III	Understand the working of BJT and MOSFET with their equivalent small signal models.	
IV	Understand the chemical processes used in fabrication of integrated circuits	

Course: Digital System Design		
Course Code:- BTEC-302-18		NAAC Code:-ECE-218
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Apply concepts of Boolean algebra for handling logical expressions	
II	Understand working and realization of combinational and sequential circuits.	
III	Understand fundamental concepts of logic families and architectural of programmable devices.	
IV	Use HDL programming tool for simulation of combinational & sequential circuits	

Course: Electromagnetic Waves		
Course Code:- BTEC-303-18		NAAC Code:-ECE-219
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand characteristics &wave propagation through transmission lines	
II	Understand Maxwell's equations for electromagnetic waves	
III	Characterize uniform plane wave.	
IV	Calculate reflection and transmission of waves at media interface	

Course: Network Theory		
Course Code:- BTEC-304-18		NAAC Code:-ECE-220
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Analyze linear networks using network theorems.	
II	Use Laplace transform to analyze transient & steady state response of linear networks.	
III	Comprehend network parameters to analyze two port networks.	
IV	Realize one port networks using Foster's and Cauer's methods	

Course: Mathematics III		
Course Code:- BTAM-303-18		NAAC Code:-ECE-221
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Apply Laplace transform for solving certain differential equations arising in mathematical modeling of various real-world phenomena.	
II	Create Fourier series expansions of periodic functions, study of their properties and applications. Also to apply Fourier transform to deal with non-periodic functions.	
III	Apply Z-transform for solving difference equations.	
IV	Understand and deal with randomness occurring in real world phenomena.	
V	Understand and utilize theory of probability, discrete and continuous distributions.	
VI	Apply method of least squares in fitting of curves.	

Course: Electronic Devices Lab		
Course Code:- BTEC-311-18		NAAC Code:-ECE-222
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Realize use of diodes in circuits with proper understanding to their working	
II	Understand characteristics & working of BJT in different configurations.	
III	Understand characteristics & working of MOSFET in circuits.	
IV	Think and design working circuits based ondiodes, BJTs and MOSFETs.	

Course: Digital System Design Lab		
Course Code:- BTEC-311-18		NAAC Code:-ECE-223
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Realize combinational circuits using logic gates.	
II	Realize sequential circuits using logic gates	
III	Write & simulate VHDL programs for combinational & sequential circuits	

IV	Think and design working projects using digital 74XX ICs.

Course: Foundational Course in Humanities	
Course Code:- HSMC101-18	**NAAC Code:-ECE-224**

CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	To develop strong natural familiarity with humanities along with the right understanding enabling them to eliminate conflict and strife in the individual society.
II	To describe political systems and different models of governing system.
III	To analyze the idea of economic development in pre and post-independence period.
IV	To interpret the idea of development in context to political, philosophical and spiritual study of economics.

Course Outcomes
Semester: 4th

Course: Analog Circuits		
Course Code:- BTEC-401-18		NAAC Code:-ECE-227
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand the biasing of transistors and analyze BJT/FET amplifiers.	
II	Analyze various rectifier and amplifier circuits.	
III	Analyze sinusoidal and non-sinusoidal oscillators.	
IV	Understand various types of Power Amplifiers.	

Course: Microprocessors and Microcontrollers		
Course Code:- BTEC-402-18		NAAC Code:-ECE-228
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand architecture & functionalities of different building block of 8085 microprocessor.	
II	Understand working of different building blocks of 8051 microcontroller.	
III	Comprehend and apply programming aspects of 8051 microcontroller.	
IV	Interface & interact with different peripherals and devices	

Course: Data Structures and Algorithms		
Course Code:- BTCS-301-18		NAAC Code:-ECE-229
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand operations like searching, insertion, deletion, traversing on linear Data Structures and to determine their computational complexities	
II	Understand operations like searching, insertion, deletion, traversing on various nonlinear Data Structures and to determine their computational complexities	
III	Write algorithms for Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity.	
IV	Apply appropriate Data Structure as per specific problem definition	

Course: Signals & Systems		
Course Code:- BTEC-403-18		NAAC Code:-ECE-230
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Mathematically characterize different types of signals and systems.	
II	Analyze the behavior of linear-shift invariant systems.	
III	Apply concepts of Fourier and Laplace Transforms to analyze continuous-time signals and systems.	
IV	Investigate discrete-time signals and systems using Discrete-Time Fourier and Z-Transforms and simple Probability concepts.	

Course: Universal Human Values – 2: Understanding Harmony		
Course Code:- HSMC122-18		NAAC Code:-ECE-231
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Students understanding 'VALUES' and 'SKILLS' as complimentary would mould themselves into engineers, who would enjoy their work and become more efficient	
II	Current problem of students of not to withstand the pressure due to work load would be solved.	
III	Student would work with team spirit rather than in competition in professional as well as in personal life.	
IV	While designing and applying technology, nurture and protection of nature would become the key parameter of the student.	
V	Holistic understanding would lead student to become more sensitive towards societal and environmental issues.	

Course: Environmental Sciences		
Course Code:- EVS-101-18		NAAC Code:-ECE-232
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Students will enable to understand environmental problems at local and national level through literature and general awareness.	
II	The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who have done practical work on various environmental Issues	
III	The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems.	
IV	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world	

Course: Analog Circuits Lab		
Course Code:- BTEC-411-18		NAAC Code:-ECE-233
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Study and verify the characteristics of diodes/BJTs in circuits with proper understanding to their working.	
II	Understand frequency response & working of various types of Oscillators.	
III	Understand characteristics & working of Power amplifiers.	
IV	Think and design working circuits based on diodes, BJTs and MOSFETs.	

Course: Microprocessors and Microcontrollers Lab		
Course Code:- BTEC-412-18		NAAC Code:-ECE-234
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Write programs for common arithmetic operations with 8-bit/16-bit numbers using 8085.	
II	Write programs for transfer, sort block of data with 8085/8086 processor(s).	
III	Write programs for controlling stepper and DC motors using Microprocessor(s).	
IV	Write programs to generate waveforms and interface ADC and DAC using of 8051 Microcontroller.	

Course Outcomes
Semester: 5th

Course: Analog and Digital Communication		
Course Code:- BTEC-501-18		NAAC Code:-ECE-336
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Analyze and compare different analog modulation schemes for their efficiency and bandwidth	
II	Analyze the behavior of a communication system in presence of noise	
III	Investigate pulsed modulation system and analyze their system performance	
IV	Analyze different digital modulation schemes and can compute the bit error performance	

Course: Digital Signal Processing		
Course Code:- BTEC-502-18		NAAC Code:ECE-337
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Represent signals mathematically in continuous and discrete time and frequency domain	
II	Get the response of an LSI system to different signals	
III	Design of different types of digital filters for various applications	

Course: Linear Integrated Circuits		
Course Code:- BTEC-503-18		NAAC Code:ECE -338
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand Differential and Cascade Amplifiers	
II	Know the basics, working and characteristics of Op-Amps	
III	Investigate various applications of Op-amps	
IV	Understand some specialized Op-Amps	
V	Interpretation of Data Sheets and their Applications thereof	

Course: Control Systems		
Course Code:- BTEC-504-18		NAAC Code:ECE-339
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Characterize a system and find its study state behaviour	
II	Investigate stability of a system using different tests	
III	Design various controllers	
IV	Solve linear, non-linear and optimal control problems	

Course: Routing and Switching		
Course Code:- BTEC-905A-18		NAAC Code:ECE-340
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Demonstrate a basic understanding of small and medium-sized networks, including general network technologies.	
II	Ability to assist the design of small and medium-sized networks, and implement the designs.	
III	Ability to construct simple networks and integrate voice, wireless, cloud, security, and storage technologies into their networks in order to support a variety of applications	

Course: Project Management		
Course Code:- BTEC-505-18		NAAC Code:ECE-341
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Study the basic concepts of Project Management	
II	Learn about Project selection and organisation. .	
III	Understand Project planning and scheduling.	
IV	Learn about Project Monitoring, control and performance	

Course: Analog and Digital Communication Laboratory		
Course Code:- BTEC-511-18		NAAC Code:ECE-342
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Study and verify the characteristics and output waveforms of AM, FM, PCM	
II	Study and compare noise in AM and FM systems	
III	Investigate the output responses of PAM, PCM, PSK, FSK, MSK.	

Course: Digital Signal Processing Laboratory		
Course Code:- BTEC-512-18		NAAC Code:ECE-343
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Write programs to develop various signals. .	
II	Write programs to generate standard sequences.	
III	Develop programs to verify convolution	
IV	Develop programs to design various filters	

Course: Linear Integrated Circuits Laboratory		
Course Code:- BTEC-513-18		NAAC Code:ECE-344
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Study and investigate the configurations of Differential amplifiers.	
II	Measure the performance parameters of am OP-Amp.	
III	Use Op-Amps for various applications.	

Course Outcomes
Semester: 6th

Course: Wireless Communication		
Course Code:- BTEC-601-18		NAAC Code:-ECE-348
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand the basic elements of Cellular Radio Systems and its design.	
II	Learn about the concepts Digital communication through fading multipath channels.	
III	Understand various Multiple Access techniques for Wireless communication.	
IV	Know about the Wireless standards and systems.	

Course: Computer Networks		
Course Code:- BTCS-504-18		NAAC Code:-ECE-349
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Explain the functions of the different layer of the OSI Protocol.	
II	Describe the function of each block of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)	
III	Develop the network programming for a given problem related TCP/IP protocol.	
IV	Learn about DNS DDNS, TELNET, EMAIL, File Transfer Protocol (FTP), WWW, HTTP, SNMP, Bluetooth, Firewalls using open source available software and tools.	

Course: Optical Fibers & Communication		
Course Code:- BTEC-602-18		NAAC Code:-ECE-350
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand the basics of Optical Communication and Optical fibres.	
II	Learn about the Optical Transmitters and Receivers.	
III	Explain the Light wave Architecture and systems.	
IV	Ability to explain the manufacturing, modulation and wave mixing in Optical Communication	

Course: Microwave and Antenna Engineering		
Course Code:- BTEC-603-18		NAAC Code:-ECE-351
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Understand the working and operation of various Microwave Tubes and Microwave Solid state devices.	
II	Learn about various important Microwave Components and the Microwave measurements that can be carried out.	
III	Explain the basic concepts and types of Antennas and its regions.	
IV	Describe the important concepts of Antenna Arrays and Antenna Aperture.	

Course: Professional Elective-2 (WLAN & Security)		
Course Code:- BTEC-906A-18		NAAC Code:-ECE-352
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Develop an understanding WLAN and its architecture.	
II	Understand the gap between wired and wireless networks.	
III	Build the knowledge of security building blocks which enable them to solve the problems of designing security solutions in wireless networks.	
IV	Learn the wireless LAN authentication protocols in detail, and enhance the skills of configuring a secure wireless network.	

Course: Optical Fibres & Communication Lab		
Course Code:- BTEC-611-18		NAAC Code:-ECE-354
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	To perform experiments based on optical communication in order to understand in depth concepts of latest communication system.	
II	To study various types of optical sources and light detectors.	
III	To know methods of slicing and connecting techniques of optical fibres.	
IV	To study different types of losses in optical fibres.	
V	To know applications of optical fibres.	

Course: Microwave and Antenna Engineering Lab		
Course Code:- BTEC-612-18		NAAC Code:-ECE-355
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Learn about general Microwave components and Microwave bench.	
II	Measure common parameters related to Microwave Oscillator(s).	
III	Determine frequency and wavelength of waveguides.	
IV	Measure and plot radiation patterns of various types of Antennas.	

Course Outcomes
Semester: 7th

Course: Professional Elective-3 (Internet of Things &Cloud Computing)	
Course Code:- BTEC-907A-18	**NAAC Code:-ECE-459**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Understanding concept of cloud computing and analyze trade-off between deploying application on cloud and using local infrastructure.
II	Identify issues and design challenges in IoT applications.
III	Select appropriate hardware and software components for IoT applications.
IV	Conceptual knowledge will help students to build IOT applications.

Course: Professional Elective-4 (Artificial Intelligence)	
Course Code:- BTEC-908A-18	**NAAC Code:-ECE-460**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Learn about the basic understanding of Artificial Intelligent system.
II	Explain about various types of Artificial Neural Networks & their models.
III	Describe Artificial Neural networks methods, operation and parameters.
IV	Explore Neural Network MATLAB Toolbox.

Course: Professional Elective-5 (Big Data Fundamentals)	
Course Code:- BTEC-909A-18	**NAAC Code:-ECE-461**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Understand the Evolution and basics of Big Data.
II	Understand the Architecture of Hadoop with its file system and its Programming.
III	Explain the Advanced analytical theory and methods.
IV	Describe the challenges in handling streaming data from the real world.

Course: Open Elective-2 (Computer Organization & Architecture)	
Course Code:- BTES401-18	**NAAC Code:-ECE-462**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Understand functional block diagram of microprocessor.
II	Apply instruction set for writing assembly language programs.
III	Design a memory module and analyze its operation by interfacing with the CPU.
IV	Classify hard wired and micro-programmed control unit.
V	Understand the concept of pipelining and its performance matrix.

Course: Open Elective-3 (Road Safety)	
Course Code:- OECE-703-18	**NAAC Code:-ECE-463**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Demonstrate the fundamentals of Traffic Characteristics and studies and interpret the results using appropriate method.
II	Explain the causes and effects of an accidents and make use of the knowledge to arrive the solutions and risk management.
III	Examine the requirements of road geometrics, vehicle & human characteristics for preparing the safety plan for road transportation.
IV	Analyze the requirements of geometric designs for the urban roads to prepare the road safety plan and suggests sustainable modes of urban transport.
V	Undertake road safety audits and design suitable alternatives.

Course: Mandatory Courses (Indian Constitution)	
Course Code:- BTMC-101-18	**NAAC Code:-ECE-464**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:
I	Understand the different dimensions of Indian Political System.
II	They will be aware about their duties towards the fellow citizens.
III	Students will be able to challenges of the democratic institutions and theoretical aspects of the state and its organs.

Course: Essence of Indian Traditional Knowledge		
Course Code:- BTMC-102-18		**NAAC Code:-ECE-465**
CO No.	**COs(Course Outcomes):** On the successful completion of course, students will be able to:	
I	Ability to understand connect up and explain basics of Indian traditional Knowledge in Modern scientific perspective.	
II	Ability to understand connects up and explain basics of Indian traditional Knowledge in Modern scientific perspective.	

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