



BABA FARID COLLEGE OF ENGG. & TECHNOLOGY

Department of Electrical Engineering

Program B.tech

PEO/PO/PSO/CO

Program Educational Objectives (PEO)

The graduates of Electrical Engineering will be able to:

1. Establish their careers in the field of Electrical Engineering and related areas, providing innovative and effective solutions.
2. Possess strong educational foundation in science, mathematics and Electrical Engineering which is essential in making successful careers in Industry/ research / higher education and will understand the professional responsibility in modern electrical power and energy related Industry through global and rigorous education.
3. To make the graduate students capable to investigate and solve the real life problems related to various areas of electrical engineering such as; electrical power systems, electrical machinery, measurement and control etc.

Programme Outcomes (PO)

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 sciences, and engineering sciences.
- 3. 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.
- 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.

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- 8. Ethics:** Apply ethical 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 a 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.

Programme Specific Outcomes (PSOs)

Students of Electrical Engineering Program will demonstrate:

1. The undergraduates students will get a detailed knowledge about the constructional features, working principles, operational features, characteristics and applications of the equipment and machinery used in various fields of electrical engineering, such as; electrical motors, generators, transformers, analog and digital meters, control devices and protection equipment, etc.
2. The undergraduates students will develop a basic understanding about the mathematical, scientific, and engineering fundamentals necessary to analyze, formulate, and solve problems related to electrical engineering practices and get motivated for self-learning, for pursuing higher studies, consultancy and field work etc.
3. The graduate students will develop multifaceted personality by studying basic subjects of other engineering branches, basic sciences, humanities and social sciences etc. so that they will be able to manage various projects of interdisciplinary nature for engineering practice

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COURSE OUTCOMES (2018-2019)

Program	Course Code	Course	CO No.	Course outcome On the successful completion of course, students will be able to:
B.Tech (Electrical Engineering)	BCHM0-101	Chemistry-I	BCHM0-101.CO1	analyze microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
			BCHM0-101.CO2	rationalize bulk properties and processes using thermodynamic considerations.
			BCHM0-101.CO3	distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
			BCHM0-101.CO4	rationalize periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
			BCHM0-101.CO5	list major chemical reactions that are used in the synthesis of molecules.
B.Tech (Electrical Engineering)	BMAT3-101	Mathematics-I	BMAT0-101.CO1	apply differential and integral calculus to notions of curvature and to improper integrals. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
			BMAT0-101.CO2	fallouts of Rolle's Theorem that is fundamental to application of analysis to Engineering problems.
			BMAT0-101.CO3	study tool of power series and Fourier series for learning advanced Engineering Mathematics.
			BMAT0-101.CO4	deal with functions of several variables that are essential in most branches of engineering.
			BMAT0-101.CO5	study essential tool of matrices and linear algebra in a comprehensive manner.
B.Tech (Electrical Engineering)	BCHM0-102	Chemistry-I Lab.	BCHM0-102.CO1	estimate rate constants of reactions from concentration of reactants/products as a function of time
			BCHM0-102.CO2	measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc.
			BCHM0-102.CO3	synthesize a small drug molecule and analyze a salt sample
B.Tech (Electrical Engineering)	BMFP0-101	Manufacturing Practices	BMFP0-101.CO1	gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.
			BMFP0-101.CO2	fabricate components with their own hands.
			BMFP0-101.CO3	get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing processes.
			BMFP0-101.CO4	assembling different components and to produce small devices of their interest.
B.Tech (Electrical Engineering)	BPHY0-101	Physics	BPHY0-101.CO1	understand the basics of Electromagnetism, Electrostatics in vacuum and in linear dielectric medium and electromagnetic waves.
			BPHY0-101.CO2	understand the basics of Faraday laws and evaluate the Maxwell's equations in different medium.
			BPHY0-101.CO3	understand the phenomenon of Magnetostatics and magnetostatic in linear magnetic medium.
			BPHY0-101.CO4	understand the Relation between electric and magnetic field of EM wave

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B.Tech (Electrical Engineering)	BELE0-101	Basics Electrical Engineering	BELE0-101.CO1	understand and analyze basic DC and AC circuits
			BELE0-101.CO2	study the use and working principle of single phase transformers.
			BELE0-101.CO3	study the application and working principles of three phase and single phase induction motors.
			BELE0-101.CO3	introduce to the components of low voltage electrical installations.
B.Tech (Electrical Engineering)	BPHY0-102	Physics Lab.	BPHY0-102.CO1	understand the working of CRO
			BPHY0-102.CO2	understand the concept of oscillation in LCR Circuits
			BPHY0-102.CO3	understand the properties of Magnetic material
			BPHY0-102.CO4	get knowledge about the electric circuit (LC and RC circuits)
B.Tech (Electrical Engineering)	BELES1-301	ELECTRICAL CIRCUIT ANALYSIS	BELES1-301.CO1	apply network theorems for the analysis of electrical circuits.
			BELES1-301.CO2	obtain the transient and steady-state response of electrical circuits.
			BELES1-301.CO3	analyse circuits in the sinusoidal steady-state (single-phase and three-phase)
			BELES1-301.CO4	analyse two port circuit behaviour.
B.Tech (Electrical Engineering)	BELES1-303	ANALOG ELECTRONIC CIRCUITS LAB	BELES1-303.CO1	develop an understanding of small signal amplifier.
			BELES1-303.CO2	design using linear transistor models
			BELES1-303.CO3	analysis at low and high frequencies, including different feedback topologies and oscillators.
B.Tech (Electrical Engineering)	BELES1-304	ELECTRICAL MACHINES – I	BELES1-304.CO1	understand the concepts of magnetic circuits.
			BELES1-304.CO2	understand the operation of D.C. machines.
			BELES1-304.CO3	analyse the differences in operation of different D.C. machine configurations.
			BELES1-304.CO4	analyse single phase and three phase transformers circuits.
B.Tech (Electrical Engineering)	BELES1-305	ELECTRICAL MACHINES LAB - I	BELES1-305.CO1	acquire skills to operate all types of D.C. machines.
			BELES1-305.CO2	analyse the speed control methods and efficiency of DC machines.
			BELES1-305.CO3	compute efficiency and voltage regulation of transformers
B.Tech (Electrical Engineering)	BELES1-401	DIGITAL ELECTRONICS	BELES1-401.CO1	understand working of logic families and logic gates
			BELES1-401.CO2	design and implement Combinational and Sequential logic circuits.
			BELES1-401.CO3	understand the process of Analog to Digital conversion and Digital to Analog conversion
			BELES1-401.CO4	use PLDs to implement the given logical problem.
B.Tech (Electrical Engineering)	BELES1-402	DIGITAL ELECTRONICS LAB	BELES1-402.CO1	give students a practical knowledge about various types of gates and verify their truth tables
			BELES1-402.CO2	give students a working knowledge to connect digital circuits and verify their truth tables.
			BELES1-402.CO3	give students knowledge of working of different combinational and sequential circuits.

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B.Tech (Electrical Engineering)	BELES1-403	ELECTRICAL MACHINES –II	BELES1-403.CO1	understand the concepts of rotating magnetic fields
			BELES1-403.CO2	understand the operation of ac machines
			BELES1-403.CO3	analyse performance characteristics of ac machines.
B.Tech (Electrical Engineering)	BELES1-404	ELECTRICAL MACHINES LAB – II	BELES1-404.CO1	obtain equivalent circuit parameters of single-phase and three- phase Induction motors
			BELES1-404.CO2	control speed of Induction motors by different methods.
			BELES1-404.CO3	draw open and short circuit characteristics of three-phase alternator and V and inverted V curves of synchronous motor.
			BELES1-404.CO4	find out voltage regulation of an alternator by different tests
			BELES1-404.CO5	synchronise two or more 3-phase alternators.
B.Tech (Electrical Engineering)	BELES1-501	Power Systems – I	BELES1-501.CO1	choose working voltage and economic size of conductors for transmission and distribution systems.
			BELES1-501.CO2	analyse performance of transmission lines and underground cables
			BELES1-501.CO3	select and design overhead line insulators and transmission lines.
B.Tech (Electrical Engineering)	BELES1-502	CONTROL SYSTEMS	BELES1-502.CO1	do modelling of linear-time-invariant systems using transfer function and state-space representations
			BELES1-502.CO2	do the stability assessment for linear-time invariant systems.
			BELES1-502.CO3	design simple feedback controllers.
B.Tech (Electrical Engineering)	BELES1-504	POWER SYSTEMS – I LABORATORY	BELES1-504.CO1	get more detailed insight about the need of various equipment used for transmission and distribution of power.
			BELES1-504.CO2	draw performance characteristics of these equipment.
			BELES1-504.CO3	practically compute parameters and performance of transmission lines and feeders.
B.Tech (Electrical Engineering)	BELES1-505	CONTROL SYSTEMS LABORATORY	BELES1-505.CO1	understand the basics of MATLAB software
			BELES1-505.CO2	understand variety of control system strategies.
			BELES1-505.CO3	acquire skills to understand all types of control components.
			BELES1-505.CO4	analyse the stability of control systems.
B.Tech (Electrical Engineering)	BELED1-511	ELECTRICAL DRIVES	BELED1-511.CO1	draw the characteristics of DC motors and induction motors.
			BELED1-511.CO2	control the speed of DC motors using power electronic converters
			BELED1-511.CO3	use power electronic converters for induction motor speed control.


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B.Tech (Electrical Engineering)	BELES1-601	POWER SYSTEMS – II	BELES1-601 .CO1	explain causes and effects of faults, components used for power system protection such as; isolators and fuses, relays, circuit breakers etc.
			BELES1-601 .CO2	classify types of relays and circuit breakers and explain their working principles and operation.
			BELES1-601.CO3	protect transmission lines, feeders, bus bars, generator and transformer.
			BELES1-601.CO4	develop concepts about the basic principles of static and digital protection
B.Tech (Electrical Engineering)	BELES1-602	ELECTRICAL MEASUREMENT S & INSTRUMENTATION	BELES1-602 .CO1	explain the constructional features, characteristics and operation of various measurement devices and transducers.
			BELES1-602 .CO2	measure R, L and C using DC and AC bridges.
			BELES1-602.CO3	use CRO and instrument transformers for measurement and instrumentation purposes.
			BELES1-602.CO4	select transducers for different applications.
B.Tech (Electrical Engineering)	BELES1-603	POWER SYSTEMS – II LABORATORY	BELES1-603 .CO1	demonstrate operation of relays and circuit breakers.
			BELES1-603 .CO2	analyze various protection schemes in power system
			BELES1-603 .CO3	plot characteristics of various types of relays, circuit breakers and fuses.
B.Tech (Electrical Engineering)	BELED1-611	INDUSTRIAL ELECTRICAL SYSTEMS	BELED1-611.CO1	represent the electrical wiring systems for residential, commercial and industrial consumers with standard symbols and drawings, SLD.
			BELED1-611.CO2	explain various components of industrial electrical systems
			BELED1-611.CO3	analyze and select the proper size of various electrical system components.
B.Tech (Electrical Engineering)	BELED1-621	WIND & SOLAR ENERGY SYSTEMS	BELED1-621.CO1	explain the basics of wind power power generation
			BELED1-621.CO2	elaborate the basics of solar power power generation
			BELED1-621.CO3	interpret the network integration issues and the power electronic interfaces for wind and solar generation
B.Tech (Electrical Engineering)	BELES1-701	POWER SYSTEM ANALYSIS	BELES1-701 .CO1	develop per unit system models of synchronous machines, transformers, transmission lines and static loads for power system studies.
			BELES1-701 .CO2	perform load flow studies by using bus admittance matrix and to do fault analysis by bus impedance matrix.
			BELES1-701.CO3	compare features of Gauss-Siedel, Newton-Raphson and Decoupled methods of load flow analysis.
			BELES1-701.CO4	analyze the effect of symmetrical and unsymmetrical faults on power system.
			BELES1-701.CO5	analyze the effect of small and large disturbances on power system stability.
B.Tech (Electrical Engineering)	BELES1-703	POWER SYSTEM ANALYSIS LAB	BELES1-703 .CO1	develop software programs for bus matrices
			BELES1-703 .CO2	study the capability to develop or use software programs for load flow analysis.
			BELES1-703 .CO3	ability to compute fault currents.


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B.Tech (Electrical Engineering)	BELED1-714	DIGITAL SIGNAL PROCESSING	BELED1-714 .CO1	represent signals mathematically in discrete-time, and in the frequency domain and analyse them using Z-transform.
			BELED1-714 .CO2	implement Discrete Time Systems using the Discrete-Fourier Transform (DFT) and the FFT algorithms
			BELED1-714 .CO3	design digital filters for various applications
			BELED1-714 .CO4	apply digital signal processing for the analysis of real-life signals.
B.Tech (Electrical Engineering)	BELES1- 801	GENERATION & ECONOMICS OF ELECTRIC POWER	BELES1- 801 .CO1	differentiate among types of loads and related terminology.
			BELES1- 801 .CO2	estimate various costs involved in the power plants and tariffs imposed on different categories of consumers
			BELES1- 801.CO3	select the size and location of a power plant
			BELES1- 801.CO4	enabled to co-operate hydro and steam power plants.
B.Tech (Electrical Engineering)	BELES1-802	MAJOR PROJECT	BELES1- 802.CO1	train the students to apply the theoretical knowledge and practical experience gained so far, by conducting the study in the form of a project work.
			BELES1- 802.CO2	get a good training in R&D work and technical leadership.
B.Tech (Electrical Engineering)	BELED1- 815	RESTRUCTURIN G OF POWER INDUSTRY	BELED1- 815.CO1	Identify the need of restructuring and deregulation of power industry
			BELED1- 815.CO2	manage congestion of transmission network.
			BELED1- 815.CO3	estimate pricing of transmission network.
			BELED1- 815.CO4	define and describe the Technical and Non-technical issues in restructured power industry.
B.Tech (Electrical Engineering)	BEEEE0-F95	HIGH VOLTAGE ENGINEERING	BEEEE0-F95.CO1	make aware about causes of High voltage
			BEEEE0-F95.CO2	develop the understanding about behaviour of solids, liquids and gases under the effect of high voltages
			BEEEE0-F95.CO3	introduce the students to generation & measurement of High voltages.
B.Tech (Electrical Engineering)	BECE0-F94	COMMUNICATI ON SYSTEMS	BECE0-F94 .CO1	understand the fundamentals of communication systems and to perform amplitude and angle modulation and demodulation of analog signals
			BECE0-F94 .CO2	perform and analyze PAM, PCM and PWM
			BECE0-F94 .CO3	analyze FDM and TDM systems.
			BECE0-F94 .CO4	design and conduct experiments, using modern communication tools necessary for various engineering applications.

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