



Department of Electrical and Electronics Engineering

Birla Institute of Technology, Mesra, Ranchi - 835215 (India)

Institute Vision

To become a Globally Recognized Academic Institution in consonance with the social, economic and ecological environment, striving continuously for excellence in education, research and technological service to the National needs.

Institute Mission

- To educate students at Undergraduate, Post Graduate, Doctoral, and Post Doctoral levels to perform challenging engineering and managerial jobs in industry.
- To provide excellent research and development facilities to take up Ph.D. programmes and research projects.
- To develop effective teaching and learning skills and state of art research potential of the faculty.
- To build national capabilities in technology, education and research in emerging areas.
- To provide excellent technological services to satisfy the requirements of the industry and overall academic needs of society.

Department Vision

To become an internationally recognized centre of excellence in academics, research and technological services in the area of Electrical and Electronics Engineering and related inter-disciplinary fields.

Department Mission

- Imparting strong fundamental concepts to students and motivate them to find innovative solutions to engineering problems independently.
- Developing engineers with managerial attributes capable of applying appropriate technology with responsibility.
- Creation of congenial atmosphere and ample research facilities for undertaking quality research to achieve national and international recognition by faculty and students.
- To strive for internationally recognized publication of research papers, books and to obtain patent and copyrights.
- To provide excellent technological services to industry for the benefit of society.

BE (EEE)

PEO (Program Educational Objectives) – BE (EEE)

1. To develop capability to understand the fundamentals of Science and Electrical & Electronics Engineering for analyzing the engineering problems with futuristic approach.
 2. To foster a confident and competent graduate capable to solve real life practical engineering problems fulfilling the obligation towards society.
 3. To inculcate an attitude for identifying and undertaking developmental work both in industry as well as in academic environment with emphasis on continuous learning enabling to excel in competitive participations at global level.
 4. To nurture and nourish effective communication and interpersonal skill to work in a team with a sense of ethics and moral responsibility for achieving goal.
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PO (Program Outcomes)

A graduate shall

- a) Be competent in applying basic knowledge of science and engineering for obtaining solution to a multi-disciplinary problem;
- b) Gain knowledge of complex engineering problem analysis;
- c) Be able to design system components and processes meeting all applicable rules and regulations;
- d) Be proficient in arriving at innovative solution to a problem with due considerations to society and environment;
- e) Be capable of undertaking suitable experiments/research methods while solving an engineering problem and would arrive at valid conclusions based on appropriate interpretations of data and experimental results;
- f) Continually upgrade his/her understanding and become masterly at modern engineering and soft tools and apply them along with other appropriate techniques and resources;
- g) Exhibit understanding of societal and environmental issues (health, legal, safety, cultural etc.) relevant to professional engineering practice and demonstrate through actions, the need for sustainable development;
- h) Be committed to professional ethics, responsibilities and economic, environmental, societal, and political norms;
- i) Demonstrate appropriate inter-personal skills to function effectively as an individual, as a member or as a leader of a team and in a multi-disciplinary setting;
- j) Be able to comprehend and write effective reports and design documentations; give and receive clear instructions; make effective presentations and communicate

effectively and convincingly on complex engineering issues with engineering community and with society at large;

- k) Be conscious of financial aspects of all professional activities and shall be able to undertake projects with appropriate management control and control on cost and time;
- l) Recognize the need for continuous learning and will prepare himself/herself appropriately for his/her all-round development throughout the professional career.

Graduate Attributes (GAs)

GA 1: Scholarship of Knowledge

Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyse and synthesise existing and new knowledge, and integration of the same for enhancement of knowledge.

GA 2: Critical Thinking

Analyse complex engineering problems critically, apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

GA 3: Problem Solving

Think laterally and originally, conceptualise and solve engineering problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.

GA 4: Research Skill

Extract information pertinent to unfamiliar problems through literature survey and experiments, apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyse and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in one or more domains of engineering.

GA 5: Usage of modern tools

Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations.

GA 6: Collaborative and Multidisciplinary work

Possess knowledge and understanding of group dynamics, recognise opportunities and contribute positively to collaborative-multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

GA 7: Project Management and Finance

Demonstrate knowledge and understanding of engineering and management principles and apply the same to one's own work, as a member and leader in a

team, manage projects efficiently in respective disciplines and multidisciplinary environments after consideration of economical and financial factors.

GA 8: Communication

Communicate with the engineering community, and with society at large, regarding complex engineering activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

GA 9: Life-long Learning

Recognise the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

GA 10: Ethical Practices and Social Responsibility

Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

GA 11: Independent and Reflective Learning

Observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

ME (CONTROL SYSTEM)

Program Educational Objective for ME (Control System)

- PEO 1:** To acquire in-depth knowledge of complex Electrical Engineering problems especially in Power Electronics to impart ability to discriminate, evaluate, analyze critically and synthesize knowledge pertaining to state of art and innovative research.
- PEO 2:** To solve complex power electronics problems with commensurate research methodologies as well as modern tools to evaluate a broad spectrum of feasible optimal solutions keeping in view socio- cultural and environmental factors.
- PEO 3:** To possess wisdom regarding group dynamics to efficaciously utilize opportunities for positive contribution to collaborative multidisciplinary engineering research and rational analysis to manage projects economically.
- PEO 4:** To communicate with engineering community and society at large adhering to relevant safety regulations as well as quality standards.
- PEO 5:** To inculcate the ability for life-long learning to acquire professional and intellectual integrity, ethics of scholarship and to reflect on individual action for corrective measures to prepare for leading edge position in industry, academia and research institutes.

Program Outcomes for ME (Control System)

- PO1:** An ability to independently carry out research /investigation and development work to solve practical problems.
- PO2:** An ability to write and present a substantial technical report/document.
- PO3:** Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- PO4:** Recognise the need for continuous learning and will prepare oneself to create, select and apply appropriate techniques and modern engineering and IT tools to solve complex power electronics problems.
- PO5:** Demonstrate knowledge of engineering and management principles and apply to manage projects efficiently and economically with intellectual integrity and ethics for sustainable development of society.
- PO6:** Possess knowledge and understanding to recognize opportunities and contribute to collaborative-multidisciplinary research, demonstrate a capacity for teamwork, decision-making based on open-mindedness and rational analysis in order to achieve common goals.
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ME (POWER SYSTEM)

Program Educational Objective for ME (Power System)

- PEO 1:** To acquire in-depth knowledge of complex Electrical Engineering problems especially in Power Electronics to impart ability to discriminate, evaluate, analyze critically and synthesize knowledge pertaining to state of art and innovative research.
- PEO 2:** To solve complex power electronics problems with commensurate research methodologies as well as modern tools to evaluate a broad spectrum of feasible optimal solutions keeping in view socio- cultural and environmental factors.
- PEO 3:** To possess wisdom regarding group dynamics to efficaciously utilize opportunities for positive contribution to collaborative multidisciplinary engineering research and rational analysis to manage projects economically.
- PEO 4:** To communicate with engineering community and society at large adhering to relevant safety regulations as well as quality standards.
- PEO 5:** To inculcate the ability for life-long learning to acquire professional and intellectual integrity, ethics of scholarship and to reflect on individual action for corrective measures to prepare for leading edge position in industry, academia and research institutes.

Program Outcomes for ME (Power System)

- PO1:** An ability to independently carry out research /investigation and development work to solve practical problems.
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- PO5:** Demonstrate knowledge of engineering and management principles and apply to manage projects efficiently and economically with intellectual integrity and ethics for sustainable development of society.
- PO6:** Possess knowledge and understanding to recognize opportunities and contribute to collaborative-multidisciplinary research, demonstrate a capacity for teamwork, decision-making based on open-mindedness and rational analysis in order to achieve common goals.
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ME (POWER ELECTRONICS)

Program Educational Objective for ME (Power Electronics)

- PEO 1:** To acquire in-depth knowledge of complex Electrical Engineering problems especially in Power Electronics to impart ability to discriminate, evaluate, analyze critically and synthesize knowledge pertaining to state of art and innovative research.
- PEO 2:** To solve complex power electronics problems with commensurate research methodologies as well as modern tools to evaluate a broad spectrum of feasible optimal solutions keeping in view socio- cultural and environmental factors.
- PEO 3:** To possess wisdom regarding group dynamics to efficaciously utilize opportunities for positive contribution to collaborative multidisciplinary engineering research and rational analysis to manage projects economically.
- PEO 4:** To communicate with engineering community and society at large adhering to relevant safety regulations as well as quality standards.
- PEO 5:** To inculcate the ability for life-long learning to acquire professional and intellectual integrity, ethics of scholarship and to reflect on individual action for corrective measures to prepare for leading edge position in industry, academia and research institutes.

Program Outcomes for ME (Power Electronics)

- PO1:** An ability to independently carry out research /investigation and development work to solve practical problems.
- PO2:** An ability to write and present a substantial technical report/document.
- PO3:** Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- PO4:** Recognise the need for continuous learning and will prepare oneself to create, select and apply appropriate techniques and modern engineering and IT tools to solve complex power electronics problems.
- PO5:** Demonstrate knowledge of engineering and management principles and apply to manage projects efficiently and economically with intellectual integrity and ethics for sustainable development of society.
- PO6:** Possess knowledge and understanding to recognize opportunities and contribute to collaborative-multidisciplinary research, demonstrate a capacity for teamwork, decision-making based on open-mindedness and rational analysis in order to achieve common goals.
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