



**KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY**

Deemed to be University U/S 3 of the UGC Act, 1956

**SCHOOL OF ELECTRONICS ENGINEERING**



# KIIT SCHOOL OF ELECTRONICS ENGINEERING

ELECTRONICS AND ELECTRICAL ENGINEERING

**INFORMATION BROCHURE**





Electronics and Electrical Engineering (EEE) is a dynamic and multifaceted field that integrates the principles of electrical engineering and electronics to develop innovative technologies and solutions. A Bachelor of Technology (B.Tech) in Electronics and Electrical Engineering equips students with a strong foundation in both theoretical concepts and practical applications. This program prepares graduates for a wide range of careers in various industries, from traditional electrical engineering roles to cutting-edge technological domains.

The School has strategically partnered with different industries like NI Instruments, Siemens, Schneider Electric etc. to incorporate industry electives in the curriculum and to facilitate training /internship for the enriching of subject knowledge of the student. The value addition training and career augmentation services prepare students to meet expectations of industry demands. The school has been accredited by IET (UK), NAAC, NBA (Washington Accord) Tier-I, UGC, ABET(USA). University got the status of Institute of Eminence by MHRD and also listed in QS (World University Ranking), NIRF, 301+ The Times Higher Education World University Ranking.

Teaching and Research being the thrust area of the School, equal emphasis is given to research activities both original and applied. Availability of State-of art laboratories in all the areas of Power System, Control System, Power Electronics, Electric Drives, Renewable Energy, Communication Engineering, VLSI & Embedded Systems. The highlight of the endeavor towards placement and in-house training for the students is the bond created between various major industries of the State and outside of it through Institute-Industry interface.



# SCOPE OF ELECTRONICS AND ELECTRICAL ENGINEERING

The scope of Electronics and Electrical Engineering is vast, encompassing numerous sub-fields and applications. Here are some of the key areas where EEE professionals make significant contributions:

## 1. Power Generation and Distribution:

- Design, maintenance, and management of power plants.
- Development of smart grids and renewable energy systems.
- Improving the efficiency and reliability of power transmission and distribution networks.

## 2. Electronics and Communication:

- Design and development of electronic devices, circuits, and systems.
- Innovations in telecommunications, including mobile networks, satellite communication, and internet technologies.
- Advancements in consumer electronics such as smartphones, laptops, and smart home devices.

## 3. Automation and Control Systems:

- Implementation of automated systems in manufacturing and production processes.
- Development of control systems for various industrial applications.
- Robotics and artificial intelligence integration in automated systems.

## 4. Embedded Systems and IoT (Internet of Things):

- Design and programming of embedded systems for various applications.
- Development of IoT devices and networks for smart cities, healthcare, and industrial automation.
- Enhancing connectivity and data processing capabilities in smart devices.

## 5. Biomedical Engineering:

- Development of medical devices and diagnostic equipment.
- Innovations in healthcare technology, including wearable health monitors and telemedicine solutions.
- Integration of electronics in prosthetics and rehabilitation devices.

## 6. Signal Processing and Imaging:

- Development of algorithms for signal processing in communication systems.
- Innovations in imaging technologies for medical, industrial, and consumer applications.
- Enhancement of audio and video processing techniques.





# OPPORTUNITIES IN ELECTRONICS AND ELECTRICAL ENGINEERING

THE OPPORTUNITIES FOR GRADUATES WITH A B.TECH IN ELECTRONICS AND ELECTRICAL ENGINEERING ARE DIVERSE AND PLENTIFUL. HERE ARE SOME KEY SECTORS AND ROLES WHERE EEE GRADUATES CAN FIND EMPLOYMENT:

## 1. Industry and Manufacturing:

Roles: Electrical Engineer, Electronics Engineer, Automation Engineer, Control Systems Engineer.

Companies: Siemens, General Electric, Honeywell, ABB, Schneider Electric.

Responsibilities: Designing and maintaining electrical systems, developing automation solutions, improving manufacturing processes.

## 2. Telecommunications:

Roles: Network Engineer, Telecommunications Engineer, RF Engineer, Systems Engineer.

Companies: AT&T, Verizon, Huawei, Ericsson, Nokia.

Responsibilities: Designing and managing communication networks, developing wireless communication technologies, optimizing signal transmission.

## 3. Information Technology:

Roles: Software Developer, Systems Analyst, IT Consultant, Cybersecurity Specialist.

Companies: Google, Microsoft, IBM, Intel, Apple.

Responsibilities: Developing software solutions, integrating hardware and software systems, ensuring cybersecurity of networks and systems.

## 4. Renewable Energy:

Roles: Renewable Energy Engineer, Solar Energy Specialist, Wind Energy Engineer, Smart Grid Engineer.

Companies: Tesla, SunPower, Vestas, Siemens Gamesa, First Solar.

Responsibilities: Designing renewable energy systems, optimizing energy efficiency, integrating renewable sources into the grid.

## 5. Automotive and Aerospace:

Roles: Electrical Systems Engineer, Electronics Engineer, Control Systems Engineer, Avionics Engineer.

Companies: Boeing, Airbus, Tesla, Ford, General Motors.

Responsibilities: Developing electrical systems for vehicles and aircraft, integrating advanced electronics, ensuring safety and performance.

## 6. Healthcare and Medical Devices:

Roles: Biomedical Engineer, Medical Device Designer, Clinical Engineer, R&D Engineer.

Companies: Medtronic, Philips Healthcare, GE Healthcare, Siemens Healthineers, Johnson & Johnson.

Responsibilities: Designing medical devices, developing diagnostic equipment, ensuring regulatory compliance.

## 7. Research and Development:

Roles: Research Scientist, R&D Engineer, Innovation Specialist, University Professor.

Institutions: Reputed University, National Laboratories, Corporate R&D Centers.

Responsibilities: Conducting cutting-edge research, developing new technologies, publishing findings, mentoring students.



# CAREER PROSPECTS IN ELECTRONICS AND ELECTRICAL ENGINEERING

The career prospects for EEE graduates are promising, with numerous paths available for professional growth and development. Here are some of the potential career trajectories:

## 1. Entrepreneurship:

Many EEE graduates start their own companies, leveraging their technical skills to develop innovative products and services. Startups in the fields of renewable energy, IoT, and consumer electronics are particularly popular.

## 2. Higher Education :

Pursuing advanced degrees (M.Tech, Ph.D.) allows graduates to specialize in specific areas and engage in advanced research.

Specializations can include nanotechnology, quantum computing, biomedical engineering, and more.

## 4. Consulting and Advisory Roles:

Experienced EEE professionals often move into consulting, providing expert advice to companies and government agencies.

Consulting roles can focus on system optimization, technology integration, and strategic planning.

## 5. Global Opportunities:

EEE graduates have opportunities to work internationally by semester exchange program, given the global demand for electrical and electronics expertise.

Multinational corporations and international research collaborations provide avenues for working abroad.





# FUTURE TRENDS AND EMERGING FIELDS



The field of Electronics and Electrical Engineering is continually evolving, with several emerging trends shaping the future landscape:

## 1. Artificial Intelligence and Machine Learning:

Integration of AI and ML in electronics for smart systems and autonomous devices. Development of intelligent control systems and predictive maintenance.

## 2. Quantum Computing:

Advancements in quantum computing technologies and their applications in cryptography, simulation, and optimization. Research opportunities in developing quantum hardware and algorithms.

## 3. Sustainable Technologies:

Innovations in green technologies and sustainable energy solutions. Development of energy-efficient devices and systems.

## 4. Cybersecurity:

Increasing importance of cybersecurity in protecting electronic systems and networks. Development of robust security protocols and systems to counteract cyber threats.



## CONCLUSION

A B.Tech in Electronics and Electrical Engineering opens up a world of possibilities, offering a blend of foundational knowledge and practical skills applicable to a wide range of industries. With its vast scope, diverse opportunities, and promising career prospects, EEE stands as a cornerstone of technological advancement and innovation. As technology continues to evolve, the role of EEE professionals will be pivotal in shaping the future, driving progress across multiple domains, and addressing the challenges of the modern world. Whether pursuing traditional engineering roles, engaging in cutting-edge research, or venturing into entrepreneurship, graduates of this program are well-equipped to make significant contributions to society and industry.

This year School opened Co-Branded M.Tech Program" in association with KPIT Technologies, Pune, where Electronics and Electrical Engineering students will get diverse domain opportunities : Autonomous driving, AUTOSAR, Vehicle Diagnostics, vehicle engineering and design, Middleware, Connected Vehicles, Body Electronics and Digital Connected Solutions.

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