



King Saud University

**Department of Electrical
Engineering**

Strategic and Operational Plans

Of EE Programs

1443

2021

Last Updated September 2021

Contents

Introduction	4
Vision, Mission and Values of College of Engineering	4
Vision.....	4
Mission.....	4
Values	4
Vision and Mission of EE Department	5
Electrical Engineering Programs	6
EE BS Program:.....	6
Program Mission	6
Program Educational Objectives.....	6
Program Goals.....	7
EE-MS Program	8
Program Mission	8
Program Goals.....	8
PhD Program	9
Program Mission	9
Program Goals.....	9
EE DEPARTMENT STRATEGIC PLAN.....	9
Goals and Strategic Objectives:	10
Alignment with Vision 2030.....	11
Educational Objectives.....	11
Vibrant Society with Strong Foundations	11
Thriving Economy Rewarding Opportunities	12
Thriving Economy Investing for the long-term	12
Research and Community Service	12
Vibrant Society with Fulfilling Lives:	12
Thriving Economy Leveraging its unique position	13

Strategic and Operational Plans..... 13
 Table I. Strategic Objectives..... 13
 Table II. Initiatives & KPIs..... 16
 Table III. Recommended Plans and Actions 18
Conclusions 21

Introduction

The aim of this document is to illustrate the strategic objectives of EE programs and the specified operational plan for the period 2020-2023. The document illustrated the alignment of these plans with the 2018-2023 strategic plan of the college of engineering.

Vision, Mission and Values of College of Engineering

The strategic plan of College of Engineering 2018-2023 identified the following

Vision

To be a world-class college and a pioneer in engineering education, innovative research and building knowledge economy.

Mission

To provide high quality education programs that address the changing needs of future engineers, serve the profession and contribute to the advancement and well-being of the society by creating and disseminating knowledge and technology to future generations through teaching, research and partnership with industry and government.

Values

The values of the college of engineering are:

- To excel at what really matters, and to aspire to the needs of society.
- To treat individuals with dignity and respect: to judge without partiality, critique without contempt, and encourage without reserve.
- To value diversity and support – hearten and promote – creativity.

Vision and Mission of EE Department

رؤية قسم الهندسة الكهربائية:

أن يقدم برامج مرموقة عالمياً تتبنى بيئة تعليمية متميزة وإسهامات ملموسة في البحث العلمي وبصمات على المجتمع عبر تعزيز مهنة الهندسة الكهربائية.

رسالة القسم:

أن نوفر تعليماً متميزاً وشاملاً يجعلنا من البرامج المرموقة في الهندسة الكهربائية. سوف نحافظ على بيئة تعليمية تسلح الخريجين بأحدث الخبرات وتحفزهم على مواصلة النجاح المهني وتخدم مجتمعنا بحلول هندسية مبتكرة.

Vision

To provide world-class programs with distinguished educational environment, tangible contributions in innovative research and positive impact on the society by fostering the profession of electrical engineering.

Mission

To provide an outstanding and comprehensive education that makes us among the best electrical engineering programs. We shall maintain distinctive environment to equip our graduates with cutting-edge experience, motivate them to achieve successful career, and serve our society with innovative engineering solutions.

The mission of the University and College focuses on the education and research for the benefits of the society. The EE programs fulfil the mission of the institute by providing an educational program that is based on providing graduates with the knowledge and professional and research skills.

Electrical Engineering Programs

EE BS Program:

Program Mission

To provide an outstanding and comprehensive education that makes us among the best electrical engineering programs. We shall maintain distinctive environment to equip our students with cutting-edge experience and serve our society with innovative engineering solutions. We shall also invoke the desire and ability of life-long learning in our graduates for pursuing successful career in engineering and postgraduate studies.

Program Educational Objectives

Within few years of their graduation, graduates of the electrical engineering would accomplish the following PEOs. Our graduates would:

PEO 1: Apply their experience and knowledge to **lead** a successful engineering career and **demonstrate** leadership in advancing their workplace.

PEO 2: **Demonstrate** commitment to professional & ethical responsibilities, and **exercise** informed judgments considering the impact of engineering solutions in global, economic, environmental, and societal contexts.

PEO 3: **Exhibit** proficiency in producing innovative solutions that **serve** the requirements of our society, employing the teamwork experience they gain in our laboratories and the practical skills they acquire in the field.

PEO 4: **Succeed in pursuing** self-learning, and **advancing** their career and post-graduate studies.

Program Goals

- To provide** our graduates with the cutting-edge experience and knowledge to lead a **successful engineering career** and demonstrate **leadership** in advancing their workplace.
- To emphasize** on professional engineering principles to get graduates to recognize ethical and professional responsibilities and make **informed judgments**, considering the impact of engineering solutions in global, economic, environmental, and societal contexts.
- To maintain** state-of-art facilities to assure distinctive practice of students on **experimentation** and engineering **design** to produce **innovative solutions** that serve the requirements of our **society**.
- To sustain** an efficient and interesting program environment that encourages **continuous self-learning** and progress in career and in post-graduate studies.

The Electrical Engineering Program is also accredited on both national level by “*Education Evaluation Commission-National Center for Academic Accreditation*” and internationally by “*the Engineering Accreditation Commission (EAC) of ABET, <https://www.abet.org>*”

EE-MS Program

Program Mission

The Master of Science Program in Electrical Engineering endeavors to prepare students in an area of specialization to meet the fast-growing expectations of the society. Program graduates will continually build on the attained knowledge and skills to demonstrate a prominent career in a wide range of professions in industry, government, as well as academia.

Program Goals

Goal 1: Prepare graduates to cope with the fast growing demands of society in their areas of specialization.

Goal 2: Emphasize on professional competence.

Goal 3: Provide graduates who would excel in research teams and solve engineering challenges.

Goal 4: Inspire graduates to demonstrate a prominent career in a wide range of professions in industry, government, as well as academia.

PhD Program

Program Mission

The Doctor of Philosophy Program in Electrical Engineering aspires to provide scholars with the aptitude and vigor to enhance the scientific knowledge in their area of specialization. Program graduates will demonstrate a prominent role in boosting the educational and academic activities of their organizations. They will also address the challenges faced by the society, through sound research and innovative solutions.

Program Goals

Goal 1: To **maintain** an effective environment that attracts prominent researchers and supports the invention of innovative solutions.

Goal 2: To **provide** graduates with the aptitude and vigor to enhance the scientific knowledge in their areas of specialization.

Goal 3: To **equip** graduates with competence and leadership qualities to demonstrate a prominent role in boosting the educational and academic activities of their organizations.

EE DEPARTMENT STRATEGIC PLAN

The Electrical Engineering (EE) Department at College of Engineering (COE), King Saud University (KSU) has developed its Strategic Plan that is aligned and falls within the COE (the Strategic Plan of the college of Engineering 2018-2023). This brief document highlights the key elements of the EE Strategic Plan which is currently being implemented. The EE Strategic Plan for EE department sets out our strategic goals, initiatives and KPIs (Key performance Indicators) toward excellence in engineering education and research. The EE department has obtained accreditation of the Engineering Accreditation Commission (EAC) of ABET, since 2009. The EE Department

is one of the earliest departments established in the Kingdom's universities. The department was established in 1382H (1962).

The Electrical Engineering department is dedicated to providing quality education that prepares students for successful careers. Students graduating with a bachelor's degree will have the necessary technical, communication, and critical thinking skills as a basis for a successful, fulfilling and life-long career in electrical engineering. The Department has recently put a great effort to update academic programs and teaching facilities as well. Several improvements in the undergraduate programs include: professional communications course and laboratory, an improved graduation project, courses in selected topics of current interest such as mobile communications, computer networks and information security are presently offered. Smart class rooms and meeting rooms, R & D laboratories in various disciplines of EE, major laboratory software and hardware upgrading, such as the electrical power and the high voltage labs, are steps to upgrade the department facilities. The Program courses are continuously revised and modified in order to follow up international trends in the field of electrical engineering specially the hot topics as renewable energy, smart systems and IoT (Internet of Things).

Goals and Strategic Objectives:

Our goals are aligned within the COE and may be classified under 4 main areas of interest. They are summarized as following:

A- Education

1. Provide undergraduate and graduate programs in Electrical Engineering to meet the requirements of the profession, and satisfy the Kingdom 2030 vision.

2. Prepare engineers who are able to excel at local and international levels.

B- Research

1. Maintain state-of-art facilities to assure distinctive research outcome.
2. Pursue research in electrical engineering fields and interdisciplinary areas to develop basic knowledge, solve engineering challenges, and enhance quality of life.

C- Community Service

1. Support and lead professional societies related to Electrical Engineering to provide active platforms to share experience on the profession and education of electrical engineering.
2. Provide effective engineering consultations, training and public education.
3. Establish calibration and standardization facilities for electrical engineering systems and components.

D- Administration and Governance

Foster structures and procedures to achieve flexibility in administration and provide efficient outcome.

Alignment with Vision 2030

The objectives aligns with KSA national priorities and is motivated by the objectives of Vision 2030. The following are the main themes of alignment:

Educational Objectives

Educational objectives are aligned with the following goal of the following Kingdom vision

Vibrant Society with Strong Foundations

Developing our Children's Character

The focus will be on the fundamental values of initiative, persistence and leadership, as well as social skills, cultural knowledge and self-awareness.

Thriving Economy Rewarding Opportunities

Learning for Working

We will continue investing in education and training so that our young men and women are equipped for the jobs of the future.

We will also focus on innovation in advanced technologies and entrepreneurship.

Thriving Economy Investing for the long-term

Maximizing our Investment Capabilities

Launching our Promising Sectors

In the manufacturing sector, we will work towards localizing renewable energy and industrial equipment sectors.

Research and Community Service

Research and community service objectives are aligned with the following goal of the vision:

Vibrant Society with Fulfilling Lives:

Developing our Cities

We will maintain our safety and security by supporting ongoing efforts to fight drugs abuse, as well as by adopting further measures to ensure traffic safety, reduce traffic accidents and minimize their tragic consequences.

Achieving Environmental Sustainability

We will seek to safeguard our environment by increasing the efficiency of waste management, establishing comprehensive recycling projects, reducing all types of pollution and fighting desertification. We will also promote the optimal

use of our water resources by reducing consumption and utilizing treated and renewable water.

Thriving Economy Leveraging its unique position

Supporting our national companies

Initially, our priority will be to fully support major national companies, which have already gained a leading market share, by promoting their products and services regionally and globally, especially in the fields of oil, petrochemicals, banking, telecommunications, food, health care, and retail. We will also seek to support Saudi companies with promising growth opportunities so they develop into new regional and global leaders. Finally, we will fully support our national industries, assisting them to market themselves abroad and to export their products.

Strategic and Operational Plans

In order to achieve the above objectives we predefined the strategic objectives in Table I. Initiatives and associated KPIs associated are given in Table II. In order to achieve the above strategic objectives an operation plan recommendations and actions is given in Table III.

Table I. Strategic Objectives

Ser	Strategic Objectives
1	<p><i>Strategic Objectives in Education</i></p> <p>Strategic Objectives in education include:</p> <ul style="list-style-type: none">1.1 Attract high potential students for BS and graduate programs.1.2 Increase opportunities for international students.1.3 Maintain top quality facilities and labs.

	<p>1.4 Acquire license for modern software environments and tools i</p> <p>1.5 Ensure the provision of practical training that thrive students experience.</p>
2	<p>Strategic Objectives in research:</p> <p>2.1 Ensure the availability of faculty members who lead research in various emerging fields of electrical engineering.</p> <p>2.2 Promote participate of researchers in interdisciplinary teams to solve engineering challenges.</p> <p>2.3 Establish research collaboration with national and international institutions.</p> <p>2.4 Promote research and development interactions with main industry companies in the Kingdom.</p>
3	<p>Strategic objectives in community service:</p> <p>3.1 Increase the involvement of faculty in professional societies.</p> <p>3.2 Enhance faculty participation in national and international conferences and workshops.</p> <p>3.3 Direct graduate students research to solve challenges faced by industry.</p> <p>3.4 Enhance participation of graduate students in national as well as international scientific conferences.</p> <p>3.5 Incorporate discussions on ethical issues in undergraduate and graduate courses.</p>
4	<p><i>Strategic objectives in administration and governance</i></p> <p>4.1 Enhance the career of faculty and staff.</p> <p>4.2 Initiate shared governance.</p> <p>4.3 Encourage faculty members to join training courses that enhance experience and leadership.</p> <p>4.4 Achieve efficiency and agility to respond to changing operational conditions.</p> <p>4.5 Improve the awareness of education and research funding opportunities.</p> <p>4.6 Promote fiscal responsibility and ensure financial stability.</p>

Table II. Initiatives & KPIs

ser	Initiatives	Success Indicators
1	<p><i>A- Education</i></p> <ol style="list-style-type: none"> 1. Increase scholarships to attract graduate students. 2. Support the new experience of design groups for BS program. 3. Promote educational interactions with international academic institutions. 4. Enhance funding of educational facilities 5. Enhance funding to obtain software license. 6. Promote use of online teaching as support to education. 7. Investigate initiating distant teaching graduate courses. 	<p>Number of graduate students.</p> <p>Number of offered assistantships and fellowships.</p> <p>Students' performance in senior design project.</p> <p>Number and collaboration of agreements with international academic institutions.</p> <p>Annual equipment purchases.</p> <p>Number of available software licenses.</p> <p>The percentage of courses that offer electronic online teaching materials.</p>
2	<p><i>B- Research</i></p> <ol style="list-style-type: none"> 1. Secure funds to hire faculty in needed new research areas. 2. Encourage faculty to apply for research funds offered by the university and the College of Engineering. 3. Encourage and support applications of research project grants that initiate new research labs. 4. Encourage undergraduate and graduate students to participate in conferences. 5. Engage R&D active researchers of national and international industry in 	<p>Number of new job opportunities offered.</p> <p>Number of submitted research proposal and the approval rate.</p> <p>Total fund for new research labs.</p> <p>Attendance rate of undergraduate and graduate students to the scientific meetings.</p> <p>Number of annual held seminars, webinars, and workshops in the department.</p>

	seminars, webinars, and workshops in the department.	
3	<p><i>C- Community Service</i></p> <ol style="list-style-type: none"> 1. Recognize faculty members who serve in professional societies. 2. Encourage faculty members to be active in participating in scientific discussions during conferences and workshops. 3. Initiate labs that provide consultation and standardization services. 4. Carry requirements and challenges in industry to thesis research topics. 	<p>Faculty contributions to profession.</p> <p>Quality and quantity of published materials that address industry problems.</p> <p>Activities of labs providing services in standardization and quality assurance.</p> <p>Number of thesis titles that address industry challenges.</p>
4	<p><i>D- Administration and Governance</i></p> <ol style="list-style-type: none"> 1. Encourage faculty to get training for developing their technical and professional skills. 2. Obtain and analyze student feedback. 3. Provide resources for student club to organize technical and social events. 4. Conduct regular meetings with the Faculty Advisory Committee for dealing with short- and long-range Departmental issues and bring ideas and action items to relevant departmental committees and the general faculty meetings. 	<p>Ratio of departmental faculty who obtain training at least once annually to the total number of staff.</p> <p>Number of Student Surveys and the participation ratio.</p> <p>Number of student club events.</p> <p>The rate of regular meetings with the Advisory Committee during the semester.</p>

Table III. Recommended Plans and Actions

Ser	Operational Objectives summary	Accreditation Committee Recommendation	Action Taken
1	Tailor programs in accordance with the 2030 vision of the kingdom.	Acquire suggestions for continuous improvement from faculty members	Discussions are conducted on various issues in department council meetings.
2	Review program course contents to ensure that students have state of art qualifications at both local and international level.	Invite faculty member o review courses to make sure they follow recent advances.	The EE department receive the proposed modification and recommendations based on course reports.
3	Provide stimulating work environment.	Arrange actions to help improving work environment for students and faculty.	The EE department secured funds through the university and through collaboration with local industry to enhance facilities.
4	Acquire licenses to major software that contribute to education and research in the field of electrical engineering.	Arrange actions to enhance funds for software licenses.	The EE department secured funds through research grants to support software licenses..
5	Pursue distinguish research in core electrical engineering and related interdisciplinary areas.	Encourage staff and post graduate students to introduce new and modern topics related to electrical engineering in their research interest	The EE department hold periodical seminars where new and modern topics of research can be introduced and discussed
6	Contribute to and provide leadership in collaboration with local agencies and industry.	Initiate discussions with stakeholders working in the applications of electrical engineering.	The EE department investigates on signing agreements with the concerned authorities and industry.

7	Achieve financial stability and shared governance.	Encourage faculty members to apply for research projects supported by research support bodies such as the Ministry of Education and King Abdulaziz City for Science and Technology	The EE department gives support in preparing proposal and participate some financing through allowing using of existed laboratories and facilities
8	Attain staff and technicians in areas that will enhance existing strengths in the department.	Assure the availability of enough lab engineers and technicians in various specialties.	The EE department works with the college of engineering to fill needed positions.
9	Attain faculty members who will connect different research areas with focus on interdisciplinary research projects.	The department maintains enough faculty members in various specialties, who can conduct research in state of art research subjects.	The EE department attempts to attract good graduate students to enhance the research work.
10	Establish closer research collaboration with academic institutions nationally and internationally.	Encourage department members to enhance their collaboration with academic institutions nationally and internationally.	Initiate activities to have collaboration with renowned institutions.
11	Establish closer research and development interactions with industry nationwide.	Encourage department members to enhance their collaboration industry nationwide.	The EE department provides all facilities for such collaboration for example the high voltage laboratory provide several testing for power cables ever year
12	Increase faculty involvement in professional societies,	Recommend the support of participating a staff	The EE department allow the travel of a staff member who has

	and national and International conferences.	member in professional societies, and national and International conferences.	accepted publication to take financing support for his participation .
13	Improve the quality of the graduate programs and increase participation of highly qualified students.	Review the policy of accepting students to be enrolled in the post graduate program	The EE department discusses the enrollment of each student individually and approved some roles of acceptance and rejection
14	Incorporate discussions on ethical issues.	Discuss techniques to maintain integrity in all programs.	The EE department council investigates any raised issues.
15	Enhance awareness of sustainability issues and best practices.	Devoting specialist in sustainability issues for organizing seminars and workshops discussing practices of sustainability issues.	The EE department invites specialist in sustainability to present lectures and open discussion with department members
16	Enhance use of resources to serve the society	Encourage enhancement of department resources.	The EE department gives all facilities for the staff and faculty to participate community and investment activities
17	Enhance the career and experience of the faculty and staff.	Encourage the faculty and staff members to enhance their career experience through involvement in professional engineering and consultation work.	The EE department arranges with agents that provide consultation and similar services to the society in the field of electrical engineering and in particular <i>King Abdullah Institute</i> at KSU to link the department to society.
18	Encourage provision of short training courses to government agencies and industry.	Encourage the faculty members to provide short courses to train engineers and technicians in local industry.	The EE program arranges with college of engineering to reach interested organizations in

			government agencies and industry.
19	Encourage shared governance.	Advice to invite external members from industrial firms to participate in department meetings	The EE department invites external members from industrial firms to participate in department meetings
20	Achieve efficiency and agility to respond to ever variations in operational conditions.	Initiate fast and efficient communication tools to carry information about problems that may face operational condition	Department council discusses emerging challenges.
21	Promote fiscal responsibility, ensure financial stability.	Encourage the employees and staff to assume financial responsibility, rationalize spending, and optimize use of the resources	The department monitors all financial transactions and advises all employees to initiate required measures to optimize the use of available resources

Conclusions

The strategic and operational plan are in agreement with the kingdom vision 2030. The operational plan currently include 20 objectives related to improvement of our EE programs. The program monitors the progress of these objectives through analysis of NCAAA accreditation standards and the associated KPIs.

Electrical Engineering Program

The B.Sc. program in Electrical Engineering at King Saud University is accredited by the Engineering Accreditation Commission (EAC) of ABET <http://www.abet.org>

CONTACT INFORMATION

*Electrical Engineering Department
College of Engineering, King Saud University
P.O. Box 800, Riyadh 11421,
Kingdom of Saudi Arabia*

Tel: (+966-11) 467-6754

Fax: (+966-11) 467-6757

Email: chair_ee@ksu.edu.sa

Website: <http://engineering.ksu.edu.sa/en/EE>