Manual including suitable information for all stakeholders about Program description, performance, and achievements

"B.Sc. of Electrical Engineering"

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1. Description of Electrical Engineering Program

The Department of Electrical Engineering awards a bachelor's degree in electrical engineering during ten semesters. The department offers high quality programs and prepares highly skilled graduates that enable them to compete in the labor market and possess basic knowledge in engineering, mathematics and basic sciences associated with practical experience in the field of electrical engineering. The department enables students to use appropriate knowledge effectively in the field of specialization to contribute to innovative engineering solutions and research, and to continue to update and develop practical knowledge and experience and acquire the necessary skills after graduation to enable them to engage in lifelong learning and the ability to work in multidisciplinary groups or teams.

The Department's courses cover two major courses in electrical engineering sciences through elective courses and a graduation project. The first track is the path of power engineering and electrical machines and the second track is the path of electronics and communications engineering. The plan also includes renewable energy fields such as solar and wind energy.

The department attracts highly qualified faculty members from various international universities and in various disciplines that serve the electrical engineering sciences and contribute effectively in the fields of teaching, scientific research and community service.

Laboratory activities are a major and important part of the educational process.

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Since the laboratory activities are a major and important part of the educational process, there are several modern laboratories that cover the decisions of the study plan of the department.

2. Graduation requirements

Total Credit Hours for Completing the Program: 162 Credit Hours

3. Jobs and graduate attributes

Graduates from the department are equipped with all the tools and skills necessary to flourish and thrive in the engineering sector. The graduates are technically knowledgeable, well-founded, fully aware of the fundamentals of basic science, engineering science, ethical and societal responsibilities. We strive to enhance graduates' skills through enrolling in graduate studies, life-long training, and interacting with professional societies.

3.1 Professional occupations/Jobs:

- Electrical Engineer
- Electrical Design Engineer
- Electrical devices Sales Engineer
- Electrical Maintenance Engineer
- Electrical Consultant Engineer
- Electrical Technical Office Engineer
- Site Supervisor Electrical Engineer
- Communication Engineer
- Electronics Engineer
- Supervisor Communication Engineer
- Supervisor Electronics Engineer
- Electrical Chief Engineer

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- Communication Chief Engineer
- Electronics Chief Engineer
- Communication Consultant Engineer
- Electronics Consultant Engineer

3.2 Graduate attributes

- **Critical Thinking:** Ability to think critically and creatively.
- **Continuous Self-Education:** Ability to acquire new knowledge on an ongoing basis.
- **Communication, Professional Behaviors, and Teamwork Skills:** Ability to interact effectively with others and implement professional behaviors in a team environment.
- **Planning and Organizational Skills:** Ability to plan and organize to reach objectives in each environment.
- **Competency to Solve Engineering Problems:** Ability to solve engineering problems using principles, tools, and practices.
- **Analysis and Interpretation:** Ability to analyze and interpret data and information.

Note: For more details, please read the Handbook of the Electrical Engineering Department,

https://drive.google.com/drive/folders/15uJV8N2UVKQBZ3n5ikUC9SLxiWHo4uHo

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4. Performance of the Electrical Engineering Program

Key Performance Indicators (KPIs) are used for assessing the quality of the Bachelor of Electrical Engineering (EENG) program and developing evidence to support that a given standard or sub-standard is met (or not). They also lead to continuous decision-making support and improvement processes.

The bachelor of EENG program adopts a total of 23 KPIs. The approved KPIs include **17** KPIs (73.9%) adopted from the program KPIs of the National Center for Academic Accreditation and Evaluation (NCAAA), **one** own KPI related to the commitment to community partnership (4.4%), and an additional **5** KPIs (21.7%) adopted from Albaha University (BU) KPIs. It is worth noting that there are **12** KPIs in common between the program and BU KPIs.

The standards adopted by the bachelor of EENG program, distributions, and numbers of the corresponding KPIs are depicted in Table 1.

Table 1 Numbers and Distribution of Program KPIs for each NCAAA Standard

Standard No.	NCAAA Standards	Number of KPIs		Percentage %
		NCAAA Program KPIs	Own KPI	
-1-	Mission and Goals	1	0	5.6 %
-2-	Program Management and Quality Assurance	0	1	5.6 %
-3-	Teaching and Learning	8	0	44.3%
-4-	Students	1	0	5.6 %
-5-	Faculty and Staff	6	0	33.3 %
-6-	Learning Resources, Facilities, and Equipment	1	0	5.6 %
Total		17 (73.9 %)	1 (4.4 %)	100%
Additional BU KPIs		5 (21.7 %)		
Total Program KPIs		23		

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Fig.1 and 2 show the distribution percentages of Program KPIs based on sources and NCAAA program standards, respectively.

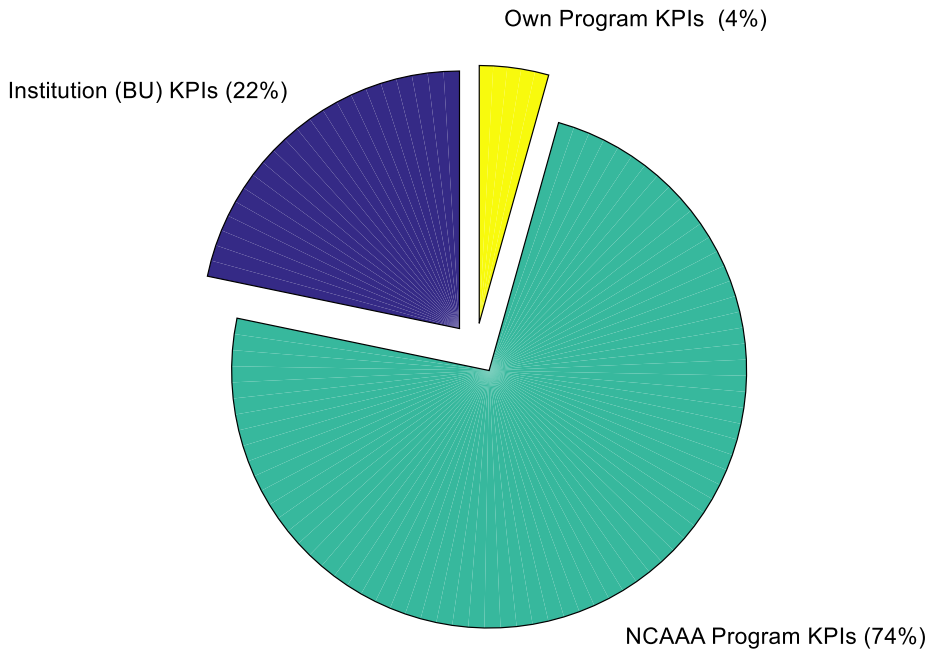

Fig.1 Distribution Percentages of All KPIs Based on Sources (23 KPIs)

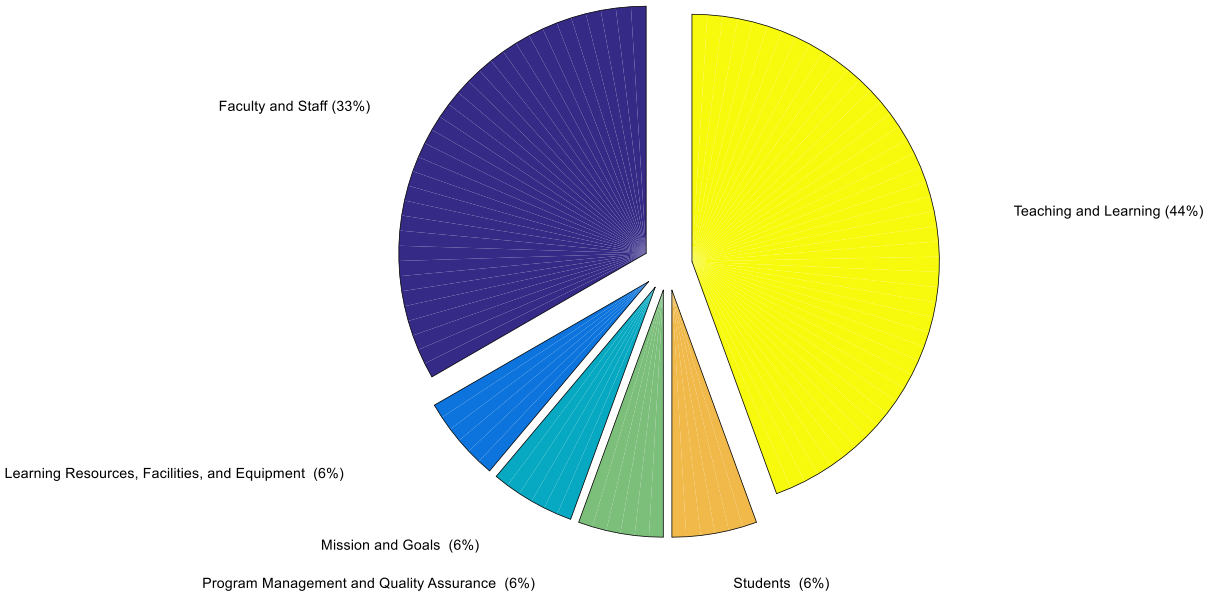

Fig.2 Distribution Percentages of KPIs Based on NCAAA Standards (18 KPIs)

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For the analysis, the Faculty of Engineering uses KPI tables with suitable benchmarks data and provides charts for analysis and discussion. The KPIs NCAAA codes, institution codes, calculations, target benchmarks, measurement methods, and time are depicted in Table 2. The target benchmark in Table 2 is the desired value for a certain KPI and is determined according to the achieved and analysis of previous KPIs performance levels of the EENG program. The EENG program is also taking into consideration BU requirements as well as standard recognized performance levels from other similar national and international programs. Table 3 shows a summary of KPIs, standards, results and benchmarks.

Table 2 KPIs Codes, Target Benchmarks, Measurement Methods and Time

KPIs Program Code	KPIs Institution Code	KPIs and Descriptions	Target	Measurement Methods	Measurement Time
NCAAA Program Key Performance Indicators					
Standard 1:Mission and Goals					
KPI-P-01	-	Percentage of achieved indicators of the program operational plan objectives (Number of performance indicators of the operational plan objectives of the program that achieved the targeted annual level / the total number of indicators targeted for these objectives in the same year*100)	55%	Ratio Calculation (Record)	3rd Week of the following academic year
Standard 2:Program Management and Quality Assurance					
KPI-P-02	-	Commitment to community partnership (a)Number of houses of expertise in the program, and (b)Number of teaching staff participants in the houses of expertise.	(a) 2 (b)4	Record	2nd Week of the first semester
Standard 3:Teaching and Learning					
KPI-P-03	KPI-I-03	Students' evaluation of quality of learning experience in the program (Average of overall	3.46	Annual Survey	10th Week

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KPIs Program Code	KPIs Institution Code	KPIs and Descriptions	Target	Measurement Methods	Measurement Time
		rating of final year students for the quality of learning experience in the program on a five point scale in an annual survey)			of the second semester
KPI-P-04	-	Students' evaluation of the quality of the courses (Average students overall rating for the quality of courses on a five-point scale in an annual survey)	3.64	Annual Survey	Last Week of the second semester
KPI-P-05	KPI-I-06	Completion rate: Graduation rate for Undergraduate Students in the specified period (Percentage of undergraduate students who completed the program during the specified period in each cohort *100)	65%	Ratio Calculation (Record)	1st Week of the following academic year
KPI-P-06	KPI-I-04	First-year students retention rate (Number of first-year undergraduate students who continue at the program the next year / the total number of first-year students in the same year *100)	88%	Ratio Calculation (Record)	1st Week of the following academic year
KPI-P-07	-	Students' performance in the professional and/or national examinations Percentage of students or graduates who were successful in the professional and / or national examinations, or their score average and median (if any)	65%	Ratio Calculation (Record)	3rd Week of the following academic year
KPI-P-08	KPI-I-05	Graduates' employability and enrolment in Postgraduate Programs (Number of graduates from undergraduate programs who within a year of graduation were: (a)employed, (b) enrolled in postgraduate programs, during the first year of their graduation / the total number of graduates in the same year *100)	(a)25% (b)6%	Ratios Calculation (Records)	3rd Week of the following academic year
KPI-P-09	-	Average number of students in the class Average number of students per class (in each teaching session/activity: (a)lecture, (b) laboratory/… etc	(a)18 (b)10	Ratios Calculation (Records)	1st Week of the first semester
KPI-P-10	KPI-I-08	Employers' evaluation of the institution graduates proficiency (Average of overall rating of employers for the proficiency of the institution graduates on a five-point scale in an annual survey)	3.83	Annual Survey	10th Week of the second semester (for previous year graduate students)

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KPIs Program Code	KPIs Institution Code	KPIs and Descriptions	Target	Measurement Methods	Measurement Time
Standard 4:Students					
KPI-P-11	KPI-I-10	Students' satisfaction with the offered services (Average of students' satisfaction rate with the various services offered by the institution (restaurants, transport, sports facilities, academic advising ..) on a five-point scale in an annual survey)	Academic Advising: 3.64 Others:3.5	Annual Survey	10thWeek of the first semester
Standard 5:Teaching Staff					
KPI-P-12	KPI-I-11	Ratio of students to teaching staff (Ratio of the total number of students to the total number of full-time or full-time equivalent teaching staff for the program separately)	12:1	Ratio Calculation (Record)	8thWeek of the first semester
KPI-P-13	-	Percentage of teaching staff distribution Percentage of teaching staff distribution based on: (a) Gender (N/A: Only Male) (b) Branches (N/A: Single Branch) (c) Academic Ranking	Prof: 20% Assoc. Prof:30% Assist Prof: 50%	Ratios Calculation (Records)	1stWeek of the first semester
KPI-P-14	KPI-I-13	Proportion of teaching staff leaving the institution (Number of teaching staff leaving the institution annually for reasons other than age retirement / the total number of teaching staff *100)	9%	Ratio Calculation (Record)	1stWeek of the following academic year
KPI-P-15	KPI-I-16	Percentage of publications of faculty members (Percentage of full-time faculty members who published at least one research during the year to total faculty members in the program *100)	50%	Ratio Calculation (Record)	10thWeek of the second semester
KPI-P-16	KPI-I-17	Rate of published research per faculty member (The average number of refereed and/or published research per each faculty member during the year (total number of refereed and/or published research to the total number of full-time or equivalent faculty members during the year))	0.62	Ratio Calculation (Record)	10thWeek of the second semester
KPI-P-17	KPI-I-18	Citations rate in refereed journals per faculty member (The average number of citations in refereed journals from published research per faculty member in the program (total number of citations in refereed journals from published research for full time or equivalent faculty members to the total research published))	8	Ratio Calculation (Record)	10thWeek of the second semester

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KPIs Program Code	KPIs Institution Code	KPIs and Descriptions	Target	Measurement Methods	Measurement Time
Standard 6: Learning Resources, Facilities, and Equipment					
KPI-P-18	KPI-I-07	Satisfaction of beneficiaries with learning resources (Average of beneficiaries' satisfaction rate with learning resources on a five-point scale in an annual survey in terms of: (a)Their adequacy and diversity (references, journals, databases, etc.), (b) The support services provided for their utilization)	3.8	Annual Survey	10thWeek of the first semester
Institutional Key Performance Indicators					
-	KPI-I-12	Proportion of faculty members with doctoral qualifications (Percentage of faculty members with verified doctoral qualifications to the total number of teaching staff of the program*100)	90%	Ratio Calculation (Record)	8thWeek of the first semester
-	KPI-I-15	Satisfaction of beneficiaries with technical services (Average of beneficiaries' satisfaction rate with technical services on a five point scale in an annual survey in terms of: (a) Suitability, (b)Safety and confidentiality, (c) Availability and ease of access, (d)Maintenance and support services)	(a) 3.5(TS) (b) 3.73(S) 3.6 (T)	Annual Survey	10thWeek of the first semester
-	KPI-I-19	Number of patents, innovations, and awards of excellence (Number of: (a)Patents and innovations, (b) Awards of excellence, obtained by the program's staff annually)	(a)1 (b)1	Record	10thWeek of the second semester
-	KPI-I-22	Satisfaction of beneficiaries with the community services (Average of beneficiaries' satisfaction rate with the community services provided by the program on a five-point scale in an annual survey)	3.5	Annual Survey	10thWeek of the second semester
-	KPI-I-23	Rate of community programs and initiatives (Number of community programs and initiatives provided by the academic program during the year)	4	Ratio Calculation (Record)	10thWeek of the second semester

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Table 3 Summary of KPIs, Standards and Benchmarks

KPI No.	KPI	KPI Results				
		Actual Benchmark	Target Benchmark	Internal Benchmark	External Benchmark	New Target Benchmark
NCAAA Program Key Performance Indicators						
Standard 1:Mission and Goals						
KPI-P-01	Percentage of achieved indicators of the program operational plan objectives	%73.1 (19/26)	55%	70.1%	NA	73.1%
Standard 2:Program Management and Quality Assurance						
KPI-P-02	Commitment to community partnership (a)Number of houses of expertise in the program, and (b)Number of teaching staff participants in the houses of expertise.	(a) 3 (b) 3	(a) 2 (b) 4	(a) 2 (b) 4	NA	(a) 3 (b) 4
Standard 3:Teaching and Learning						
KPI-P-03	Students' evaluation of quality of learning experience in the program	4.02	3.46	3.98	3.5	4.02
KPI-P-04	Students' evaluation of the quality of the courses	3.8	3.64	3.55	3.5	3.8
KPI-P-05	Completion rate: Graduation rate for Undergraduate Students in the specified period	66% (29/44)	65%	44%	54.6%	66%
KPI-P-06	First-year students retention rate	89.1% (41/46)	88 %	86 %	87 %	89.1 %
KPI-P-07	Students' performance in the professional and/or national examinations	NA	65%	NA	NA	65%
KPI-P-08	Graduates' employability and enrolment in Postgraduate Programs (a) employed (b) enrolled in postgraduate	(a) 26.7 % (8/30) (b) 6.7 % (2/30)	(a) 25% (b) 6.6%	(a) 14.5 % (b) 4.9 %	(a) 27 % (b) 6.9 %	(a) 27 % (b) 6.9 %

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KPI No.	KPI	KPI Results				
		Actual Benchmark	Target Benchmark	Internal Benchmark	External Benchmark	New Target Benchmark
KPI-P-09	Average number of students in the class (a) lecture, (b) laboratory/… etc	(a) 18.3 (b) 10.7	(a) 18 (b) 10	NA NA	NA NA	(a) 18 (b) 10
KPI-P-10	Employers' evaluation of the institution graduates proficiency	3.91	3.83	4.1	3.3	3.91
Standard 4: Students						
KPI-P-11	Students' satisfaction with the offered services (a) Academic Advising (b) Others	(a) 3.65 (b) 3.8	(a) 3.64 (b) 3.5	(a) 3.8 (b) 3.4	(a) 3.7 (b) 3.7	(a) 3.7 (b) 3.8
Standard 5:Faculty and Staff						
KPI-P-12	Ratio of students to teaching staff	12.6:1 (252/20)	12:1	14:1	16:1	12:1
KPI-P-13	Percentage of teaching staff distribution	(a) Prof: 11.11% (b) Assoc. Prof: 16.7% (c) Assist Prof: 72.2%	Prof: 20% Assoc. Prof: 30% Assist Prof: 50%	NA	NA	Prof: 20% Assoc. Prof: 30% Assist Prof: 50%
KPI-P-14	Proportion of teaching staff leaving the institution	5% (1/20)	9%	6%	7.5%	5%

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KPI No.	KPI	KPI Results				
		Actual Benchmark	Target Benchmark	Internal Benchmark	External Benchmark	New Target Benchmark
KPI-P-15	Percentage of publications of faculty members	60% (12/20)	50%	64%	62.5%	62.5 %
KPI-P-16	Rate of published research per faculty member	0.85 (17/20)	0.62	0.42	0.46	0.85
KPI-P-17	Citations rate in refereed journals per faculty member	21.06 (358/17)	8	4.7	3.03	9.6
Standard 6: Learning Resources, Facilities, and Equipment						
KPI-P-18	Satisfaction of beneficiaries with learning resources (Average of beneficiaries' satisfaction rate with learning resources) **TS: Teaching Staff** **S: Students** **T: Total**	3.92 (TS) 4.02 (S) 3.97 (T)	3.8	3.64	3.48	3.97
Institutional Key Performance Indicators						
KPI-I-12	Proportion of faculty members with doctoral qualifications	90% (18/20)	90%	68.4%	53.7%	90%
KPI-I-15	Satisfaction of beneficiaries with technical services (Average of beneficiaries' satisfaction rate with technical services) **TS: Teaching Staff** **S: Students** **T: Total**	(a) 3.8 (TS) (b) 3.9 (S) 3.85 (T)	(a) 3.5 (TS) (b) 3.73 (S) 3.62 (T)	(a) 3.9 (TS) (b) 3.96(S) 3.93 (T)	(a) 3.7 (TS) (b) 3.7 (S) 3.7 (T)	(a) 3.8 (TS) (b) 3.9 (S) 3.85 (T)
KPI-I-19	Number of (a) patents and innovations (b) awards of excellence	(a) 0 (b) 1	(a)1 (b)1	(a) 0 (b) 0	(a) 2 (b) 2	(a) 1 (b) 2

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KPI No.	KPI	KPI Results				
		Actual Benchmark	Target Benchmark	Internal Benchmark	External Benchmark	New Target Benchmark
KPI-I-22	Satisfaction of beneficiaries with the community services (5-points scale)	4.18	3.5	4.18	4.2	4.2
KPI-I-23	Number of community programs and initiatives	4	4	3	4	4

The target benchmarks are completely achieved for **17** key performance indicators (KPIs) out of **23** KPIs (**73.9%**). The targets benchmarks are also semi-achieved for **3** KPIs and are not achieved for **3** KPIs. The results for some of the non-achieved of KPIs are reasonable and not far from the target benchmarks.

For more details and KPI analysis, please read the KPI'S Program Report:

Also attached, the approval of the Electrical Engineering Department Council, Session No. 2 (Subject No. 5), to approve the key performance indicators (KPI) file for the program 1442-1433 AH.

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5. Achievements of Electrical Engineering Program (2011-2022)

The department's strategic objectives, as well as the axes and objectives that go with them, were created by and integrated with the university's strategic plan 2011-2022 DH and the college's strategic plan 2016-2022 DH.

The emphasis was on putting the specified aims into action through numerous plans, initiatives, and projects, as summarized below:

5.1 Objective 1: Excellence in engineering education and learning

1- Quality assurance theme

Objectives
1- Developing the curriculum and the educational program in the department by the standards of total quality and academic accreditation.
2- Creating an atmosphere conducive to the application of the philosophy and principles of quality and excellence in performance and the requirements of scientific and academic leadership.

The Department of Electrical Engineering was established in the academic year 1429/1430 AH according to the study plan of the College of Engineering at Umm Al-Qura University. In the academic year 1431/1432 AH, the department updated the study plan to allow the student to study 162 credit hours and to grant the graduating student a bachelor's degree in electrical engineering within ten semesters, of which the student spends two semesters in the preparatory year for the College of Engineering. After the update, the plan was called (the 1430 AH plan).

In the academic year 1433/1434 AH, a study plan for the college was updated and included all scientific departments. It was approved under the name (Plan 1433 AH). It was approved by all the relevant councils, starting from the department council until the Minister of Higher Education approved the minutes of the University Council in its third session for the academic year 1434/1435 AH on 06/21/1435 AH. According to this plan, a student must pass 162 credit hours to obtain a Bachelor of Science in Engineering degree.

In the academic year 1431/1432 AH, the bridging system was introduced at the university. Within the framework of this system, a bachelor's program in electrical engineering for bridging students has been developed. The Umm Al-Qura plan has

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been amended so that the student studies a total of 152 credit hours so that the student enrolled in this program completes no less than 60% of the total hours of the Umm Al-Qura program approved in the department without including 12 hours of university requirements from it. This modification was called (Bridge Plan). In the academic year 1438/1439 AH, the bridging plan was canceled, and new batches of bridging students were accepted under a unified study plan with regular students in the department.

In the academic year 1438/1439 AH, the study plan of 1433 AH was modified as a result of the amendment of university requirements under the name (Plan 1438 AH). This is the currently approved plan.

2- Teaching & learning quality theme

Objectives
1- Keeping abreast of the global development in scientific knowledge and applied techniques, contributing to and adding to them, and benefiting from modern teaching and learning resources and means
2- Developing the curriculum and the educational program and ensuring that it is compatible with the required professional and scientific standards and the expectations of the concerned parties.

Some courses are taught electronically using the Rafid program, and electronic media is used in interactive education.

3- Student learning support theme

Objectives
1- Supporting students and providing them with high-quality education and development services that increase their efficiency and competitiveness in the labor market.
2- Expanding the student exchange and student activities with other local/international colleges in the scientific and professional fields and student activities.
3- Integrated scientific, intellectual, personal, and physical preparation by international specifications and standards without prejudice to our lofty Islamic values.
4- Supporting and encouraging excellence, creativity, innovation, and talent discovery.

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These objectives are achieved through the various student activities carried out by the Deanship of Student Affairs at Al-Baha University.

4- HR - Teaching staff theme

Objectives
1- Developing the capabilities of faculty members through effective training programs and attending conferences and scientific forums that keep pace with global development.
2- Encouraging excellence and creativity in various activities and programs and embracing development initiatives undertaken by faculty members.
3- Developing the department's administrative systems in line with the comprehensive quality standards and academic accreditation.

Teaching Staff members in the department have been qualified from the scholarship program to various American, UK, Canadian and Australian universities since the academic year 1430 AH. In the year 1444 AH, the number of Saudi Teaching Staff members reached (2) with the rank of associate professor, (7) members with the rank of assistant professor, and (2) members with the rank of teaching assistant. In addition, the number of students on scholarships is (7) members in the different academic levels (Master's, Ph.D.). Non-Saudi Teaching Staff members were hired with several (9) in the academic year 1444 AH.

5.2 Objective 2: Providing a good environment for teaching and learning

1- Continuing education theme

Objectives
1- Developing the department's role in developing the capabilities of the local community and its institutions to continue teaching and learning at the individual, collective and institutional levels.
2- Organizing distinguished and specialized scientific conferences and symposia.
3- Encouraging enrollment to continue teaching and learning after graduation.

In the academic year 1430/1431 AH, a bridging program was established in the department to allow graduates of community colleges to complete their university

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education and obtain a bachelor's degree through an academic program independent of the regular program in the department.

In the academic year 1437AH, a bridging program was developed in which students study within the study plan of regular students. Three tuition payments are accepted into this program.

2- Learning Environment Theme

Objectives
1- Continuous support and encouragement for learners to ensure an attractive and safe environment
2- Continuing to provide programs inside and outside the department that respond to the requirements of students and the community in terms of content, the flexibility of access, and the needs of the labor market

The University City in Al-Aqiq represents an attractive and safe environment for students, as most of the integrated infrastructure of the university city has been completed.

5.3 Objective 3: Excellence in the field of scientific research

1- Specialized Research Theme

Objectives
Improving the efficiency and effectiveness of scientific and applied research for the department.

The Teaching Staff members in the department contributed to the research activity in the name of Al-Baha University through research published in international conferences and meetings.

One of the faculty members of the electrical engineering department is included in the Elsevier List of the World's Top 2% Scientists for the years 2021, and 2022 and in the Stanford University List of Top 2% Scientists for the year 2020.
Links:
https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/3

https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3000918

https://data.mendeley.com/datasets/btchxktzyw/2

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2- Human Resources Theme

Objectives
Developing the efficiency and capabilities of faculty members in the field of scientific and applied studies and research

The competencies and capabilities of faculty members in the field of scientific and applied scientific studies and research have been developed through scientific forums, workshops, and training courses, including:

1) The First Annual Forum, Deanship of Scientific Research and Higher Education, Al-Baha University, 17-18 3/2014DH,
2) Workshop on the mechanisms of achieving quality performance, Al-Baha University, 12/4/2014 DH
3) The First Forum for Academic Accreditation - Future Trends", Deanship of University Development and Community Service, Al-Baha University, 20/5/2015 DH
4) Training course on Academic Quality Assurance, Deanship of University Development and Community Service, Al-Baha University, 5-9/9/2015 DH.
5) Aafaq Workshop - Updating the Afaq 2 Plan, Al-Baha University, 2/2/2016 DH.
6) Workshop on "Basic Concepts in Key Performance Indicators", The National Center for Measurement of the Performance of Public Institutions (Adaa), Al-Baha University, December 12, 2018 DH.
7) Training program on "Basic Requirements in Academic Advising" Department for Developing the Skills of Faculty Members, Al-Baha University, 12/2/2019 DH.

3- Infrastructure Theme

Objectives
Establishing and developing laboratories and providing modern technologies in the field of scientific research.

The Electrical Engineering Department contains sixteen (16) laboratories. These laboratories have been purchased since the establishment of the department in the year 1429 AH from international companies that have long experience in designing educational engineering laboratories.

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4- Postgraduate Studies Theme

Objectives
Creating postgraduate programs in the department

In the academic year 1432/1433 AH, a committee was formed to study and prepare a proposal for a master's program in the Department of Electrical Engineering, which aims to prepare scientific cadres in the fields of advanced electrical engineering that are qualified to lead and develop the scientific research process, absorb technical progress, participate in the development of industry and solve environmental problems.

In the academic year 1434/1435 AH, the previous proposal was re-examined and updated, and a master's program was proposed in four different tracks (the electric power systems track, the electric traction, and propulsion track, the communications track, and the electronics track).

In the academic year 1439/1440 AH, a master's program in the Department of Electrical Engineering was re-examined, to prepare scientific cadres in the fields of renewable energy engineering. The proposal was approved by the College Council in its seventeenth session on 21/07/1440 AH.

5.4 Objective 4: Contributing to programs and projects directed to community service

Objectives
Linking the department's educational and scientific research programs and curricula to the needs of the community and the region's resources, and improving the quality of environmental, social, and economic life for the community.

The department participated in academic activities and events related to community service for the various parties in the Al-Baha region. These activities include:

1) Mawhiba program

In the academic year 1433/1434AH, the department participated in the Mawhiba program sponsored by the King Abdulaziz and His Companions Foundation for Giftedness and Creativity by hosting 16 students from secondary school students in the Kingdom through the department providing students to complete their research projects in the department's laboratories in the period 6-24 Shaban 1434 e. Figures

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No. (14) and (15) show some of the work carried out by the students in the laboratories of the Electrical Engineering Department.

2) Participation in the scientific conference for male and female students of higher education in the Kingdom

The department participated in two research papers in the Fifth Scientific Conference for male and female students of higher education in the Kingdom in the academic year 1434/1435AH. The department also participated in three research papers in the Sixth Scientific Conference in the academic year 1435/1436, and one research was selected.

A) First research work (5th Scientific Conference)
Title: Electric traction systems and sustainable transportation.

B) The second research work (5th Scientific Conference)
Title: A study on the organizers of the intermittent mode feeding units.

C) The first research work (6th Scientific Conference)
Title: Computer-Aided Design for Electrical Induction Machines. (Applications of Electric Traction and Propulsion Systems)

3) Implementation of student graduation projects that serve the community

Among which we mention projects that help in solving some problems when operating the electricity system in the south of the Kingdom for the different levels of voltage in the transmission and distribution system, using a solar-powered Volvo car and hydrogen energy for use at Al-Baha University, providing electrical energy in the university buildings using smart and thermal devices, developing wheelchair-using embedded systems and artificial intelligence and applying it in the Mecca Holy Mosque.

4) Participation in a scientific symposium in cooperation with the saudi council of engineers - Al-Baha branch

Seminar topic:

Transition to the application of the international voltage 230/400 volts in Saudi Arabia and its impact on the consumer.

In the theater of the College of Engineering in Burgdan 1435 AH, where the Deanship of the College of Engineering organized this Seminar.

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5) Participation in scientific research related to the development of the Al-Baha region and funded by the deanship of scientific research at the university:

i. Study on the reduction of electrification resulting from friction.
ii. Total solar radiation on the city of Al-Baha (Saudi Arabia): a comparison between the expected results of the numerical models and the measured results (023/1434 AH).
iii. Spreading the use of solar water heaters in the Al-Baha region.
iv. Design and implementation of a renewable energy system to generate electricity in rural and isolated areas in the Al-Baha region.

5.5 Objective 5: Contributing to Engineering consultancy and different training courses programs directed to community service

No.	Specialization	Fields of engineering consultancy
1	Renewable Energy	• Engineering and technical consultations in the field of renewable energy and energy efficiency. • Holding courses, seminars and workshops. • Technical, financial and analytical feasibility studies.
2	Energy Engineering (Power Electronics)	• Consultation work in the field of energy engineering in terms of planning and designing stations and networks. • Providing solutions regarding the uses of power electronics in renewable energy networks and how to control them to increase the reliability of the network. • Providing general courses in the fields of electrical engineering, as well as specialized courses in the field of power engineering and power electronics.

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3	High Voltage	• Engineering consultancy in the field of low-voltage systems design (lighting systems design, power systems design, design schedules for low voltage panels, design of protection circuit breakers, selection of transformer and generator and design of the Capacitor Bank Design). • Prepare the Electrical Bill of quantities for the projects. • Providing a training course in the AutoCad (2-D) engineering drawing program. • Providing a course in designing lighting systems using the Relux program. • Providing a course in designing power systems for various projects. • Providing a course in designing load schedules for low voltage panels. • Providing a course in the design of the transformer and generator, and A.T.S, UPS and power factor improvement panel design (Capacitor Bank Design).

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