Program Guide

Department of Electrical Engineering
College of Engineering
Najran University

COLLEGE OF ENGINEERING BROCHURE
THE DEAN'S WORD

The Government of the Custodian of the Two Holy Mosques has made all efforts to ensure its citizens' welfare, placing them among the top nations worldwide.

2030 vision has laid out the road map for our Nation to be among the world's leading nations. Among the main programs for realizing the 2030 vision is the Human Capability Development Program. This Program aims to ensure that Saudi citizens have the capabilities to compete globally by instilling values, developing primary and future skills, and enhancing knowledge. It also focuses on upskilling citizens by providing lifelong learning opportunities and supporting innovation and entrepreneurship culture to ensure Saudi Arabia's competitiveness. Ensuring our Nation's competitiveness through developing human capital is part of Najran University's top priorities.

The College of Engineering was established in 1431 AH according to the recommendation of the University Council to meet the needs of the Najran Region. The college has established five scientific departments: Electrical Engineering, Civil Engineering, Architectural Engineering, Mechanical Engineering, and Chemical Engineering. The college is constantly working and developing its programs to ensure its graduates have a competitive edge and meet the labor market demands.

The College endeavors to provide an integrated learning environment to achieve the plans of its programs which have been built according to the latest international standards and to keep up with the standards of the Saudi National Center for Academic Accreditation and Assessment (NCAAA) and the American Accreditation Board for Engineering and Technology (ABET)
These have been done through the following:

1. We are recruiting highly qualified academic faculty members from several universities worldwide and ensuring diversity among our faculty.

2. Providing classrooms with the best modern technologies in education allows the student to receive information in various ways of learning in the classroom. Therefore, students can use the programs of laptops /computers and the applications of tablets and cell devices to synchronize them with the smart projector in the classroom.

3. We are establishing laboratories equipped with the latest equipment for all departments to enrich the learning experience for our students.

4. We are encouraging research and multidisciplinary research, recruiting top talents, and encouraging faculty and students to use graduation projects for publications and prototypes. The above mechanisms have helped the college to be at the first position in research at Najran University thrice in a row (2020-2021-2022).

Dean
College of Engineering, Najran University
Saleh Almasabi, PhD

.

CONTENTS

INTRODUCTION ABOUT NAJRAN UNIVERSITY

The custodian of the Two Holy Mosques King Abdullah Bin Abdulaziz, may Allah have mercy on him, issued a royal decree of establishing Najran University on Shawaal 10th,1427A.H. during the inauguration ceremony of the University campus.

Najran University is located on the Eastern outskirts of the city of Najran, with an area of 18 million square meters, thus becoming the largest University campus all over the Kingdom. The University will include two campuses for males and females. It consists of 14 and 10 colleges for males and females respectively, with an overall capacity of 45 thousand students. The university will also have a medical city, a research center, a sport and entertainment arenas and accommodation for the faculty and staff members as well as students. There will also be a future investment city to serve as a trust foundation for the university. The investment will include, not exclusively, hotels, commercial centers and private schools.

UNIVERSITY VISION AND MISSION

Vision

The vision of Najran University is for ***" Leadership in teaching, learning and scientific research to build an innovative and internationally competitive knowledge society."***

Mission

Najran University is committed in ***" Providing distinguished education and producing competitive scientific research that contribute to the development of the knowledge economy and building effective community partnerships, by strengthening institutional governance that supports creativity and national values."***

Values

Najran University has number of values to achieve its goal in the field of higher education, listed as follows:

(1) Leadership: the science and art of guiding others towards achieving goals with the lowest costs and highest returns.

(2) Responsibility: Positive interaction towards the university and society based on a sense of nationalism.

(3) Honesty: faithfully performing tasks and fulfilling rights and duties.

(4) Transparency: Clarity in all duties and activities, decisions and transactions.

(5) Excellence: doing business in an elaborate and innovative manner.

(6) Moderation: moderation in all actions in thought and approach, and application of the constants, taking into account the surrounding variables.

(7) Creativity: supporting novelty , especially in ideas, with the use of what has been created in the form of a product.

(8) Empowerment: Providing opportunities for participation for all male and female employees of the university in decision-making.

(9) Affiliation: loyalty to the homeland and the promotion of its principles and values ??in the university's programs and activities.

(10) Integrity: Commitment to ethical and professional principles based on Islamic Sharia.

Rules and Regulations

Najran University's regulations are based on the statute and regulations of the Board of Higher Education and Universities, which was approved by the Council of Ministers on 4. 4. 1414 H. The statute consists of the following:

-Board of Higher Education Statute.
-Regulations of College Education and Examination.
-Regulations of University Financial Affairs.
-Regulations of Hiring Non-Saudis at Saudi Universities.
-Regulations of Scholarships & Training of University Personnel.
-Unified Regulations of Higher Studies at Saudi Universities.
-Regulations of Saudi Personnel Affairs- Faculties and the Like.
-Regulations of Scientific Research.
-Regulations of Scientific Societies at Saudi Universities.

Process for Students Evaluation

The process of evaluating students' performance in the courses registered by the student in each semester will be conducted by the instructors who are teaching the courses. The instructor evaluates students' performance in each course. The instructor designs the assessments for finding out the attainment of the course learning outcomes specified by the curriculum committee. The instructor may distribute marks on home assignments, quizzes, mid-semester examinations, term project and a final examination to objectively evaluate students' performance, which later will be accumulated over percentage and finally converted into the attainment of the course learning outcomes (CLOs) and student outcomes (SOs) using CLOSO software. In the courses that involve laboratory classes, laboratory performance, written reports (for each experimental work throughout the semester) and the final laboratory examination are used to assess the attainment of

the CLOs and SOs. Based on the policy and implementation rules of examinations and grades, EE program has formulated a grading policy that was approved by the departmental council.

Assessment of a course is usually based on the combination of grades awarded to course work (performance throughout the semester) and the final examination. Each course has a total of 100 marks. Out of this, the instructor evaluates 50% marks to the course work consisting of quizzes, homework, term projects and mid-term or other periodic assessments while the remaining 50% is evaluated in the final examination. A grade of "Incomplete" (IC) is given to the student if the course requirements are not fulfilled by the student. This is usually endorsed in courses that require a project to be completed by the student. It is awarded only on the recommendation of the instructor and approval of the Department Council. The student getting IC must fulfill the requirements during the following semester; otherwise the IC is automatically changed to "F".

Najran University requires that students do not miss more than 25% of the total number of lectures, labs, and tutorials. Students failing to meet this requirement in any of the courses are prohibited from appearing in the final examination of that course and earn a DN (Denied) grade in that course. A student who is absent in the final examination of a course(s) for an acceptable reason approved by the department council and the dean of the college, is allowed to take the examination at a later date.

Table 1 shows the grading system of Najran University. The instructor awards the marks out of 100. The marks are converted to a letter grade and grade points according to the following Table 1.

Table 1 Grading System at Electrical Engineering Program in Najran University.

Percentage	**Evaluation**	**Letter Grade**	**Grade Point Average out of 5**
95 – 100	Excellent Plus	A +	5.00
90 to less than 95	Excellent	A	4.75
85 to less than 90	Very Good Plus	B +	4.50
80 to less than 85	Very Good	B	4.00
75 to less than 80	Good Plus	C +	3.50
70 to less than 75	Good	C	3.00
65 to less than 70	Pass plus	D +	2.50
60 to less than 65	Pass	D	2.00

Less than 60	Fail	F	0.00
	Incomplete	IC	-
	Denied	DN	-

At the end of each semester, the instructors submit the grades of all courses through the online grading system (Edugate) that is approved by the department head and dean of college of Engineering. The student's performance and progress are determined by the grade point average (GPA). A sample of student's grade report and the calculated GPA for six (6) subjects in a typical semester is shown in Table 2.

Table 2 Calculated Grade Point Average (GPA).

Course	Credit Hours (CH)	Point Marks out of 100	Letter Grade	Grade points per Credit Hours (GP)	Total Grade Points CH×GP
Course 1	2	90	A	4.75	9.50
Course 2	3	85	B+	4.5	13.5
Course 3	3	78	C+	3.5	10.5
Course 4	3	82	B	4.0	12.0
Course 5	4	77	C+	3.5	14.0
Course 6	2	71	C	3.0	6.0
Total	17				65.5
Computed GPA = Total Grade Points / Total Credit Hours = 65.5/17=3.85					

INTRODUCTION ABOUT ELECTRICAL ENGINEERING DEPARTMENT

The Electrical Engineering Department was established in the year 2008 as one of the major departments of the university and has been actively engaged in teaching in different specialization of Electrical Engineering.

Department offers bachelor's degree in electrical engineering. Until now, the program is offered for males only. The program is mainly a teaching program until now. Courses in Electrical Engineering are offered through the College of Engineering. The department produced its first batch of graduates in 2013.

The program gives emphasis mainly on teaching basic skills, theoretical knowledge and practical experiences necessary for practicing the occupation of Electrical Engineering. In addition, the plan of the bachelor of electrical engineering program was also updated in the year 1441-1443 ah - corresponding to the year 2020 ad, to keep pace with the 2030 vision and keep pace with the

requirements of the labor market and its changes, as a number of courses were added, and the content of the courses was updated in line with local and global changes in the fields of renewable energy, communications and robotics and electronics.

The department is fully equipped with laboratories that cover all aspects of electrical engineering knowledge. These laboratories are continuously updated to keep pace with the latest technology requirements.

DEPARTMENT'S VISION AND MISSION

Vision

"Leading department in electrical engineering education, applied research and community services."

Mission

"To provide the students a conducive environment for academic learning that produces qualified electrical engineers to adequately meet the national requirements, and address the community challenges through research, and advanced technologies."

The figure 1(a) below shows the organizational chart for College of Engineering and figure 1 (b) shows the organization Flow chart for Electrical Engineering department.

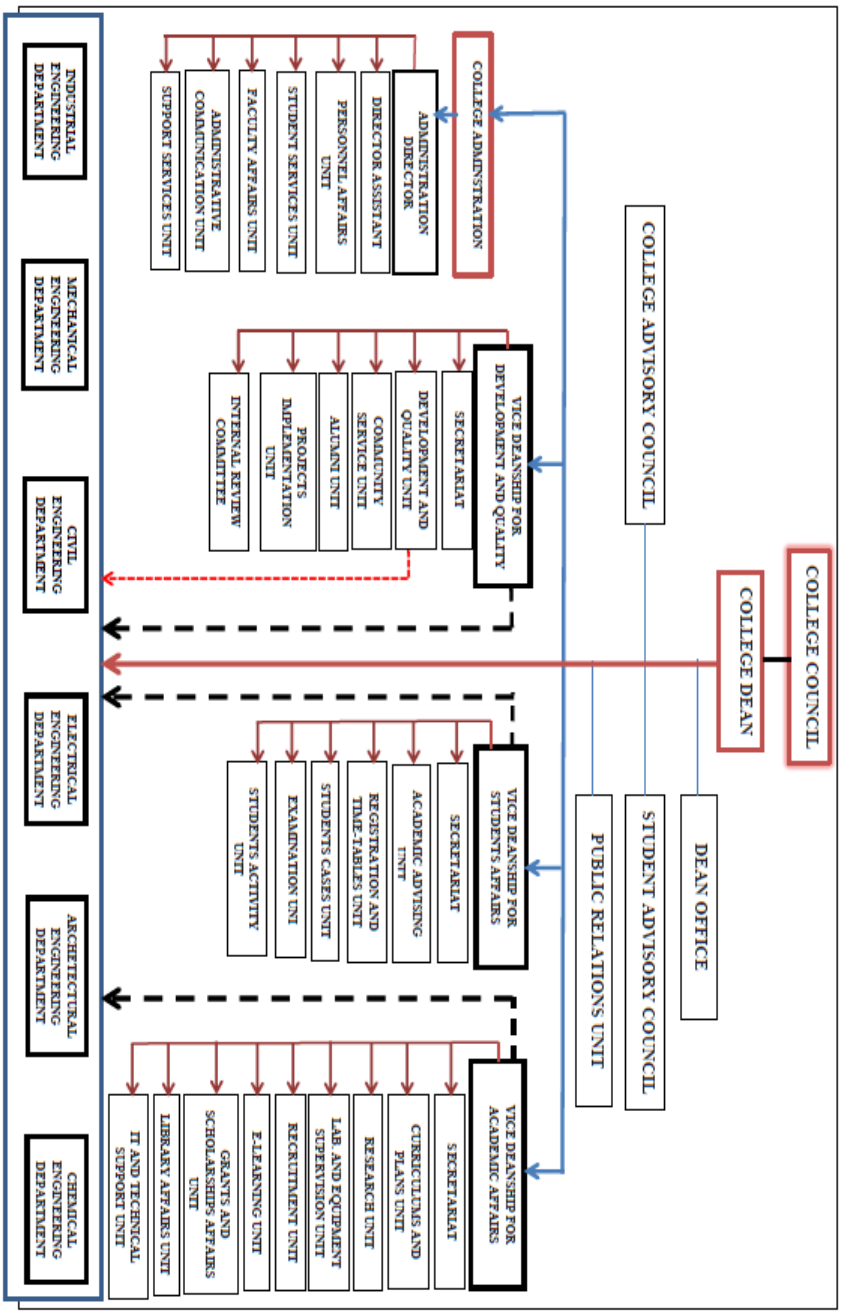

Figure 1 (a): Flow chart for college of engineering

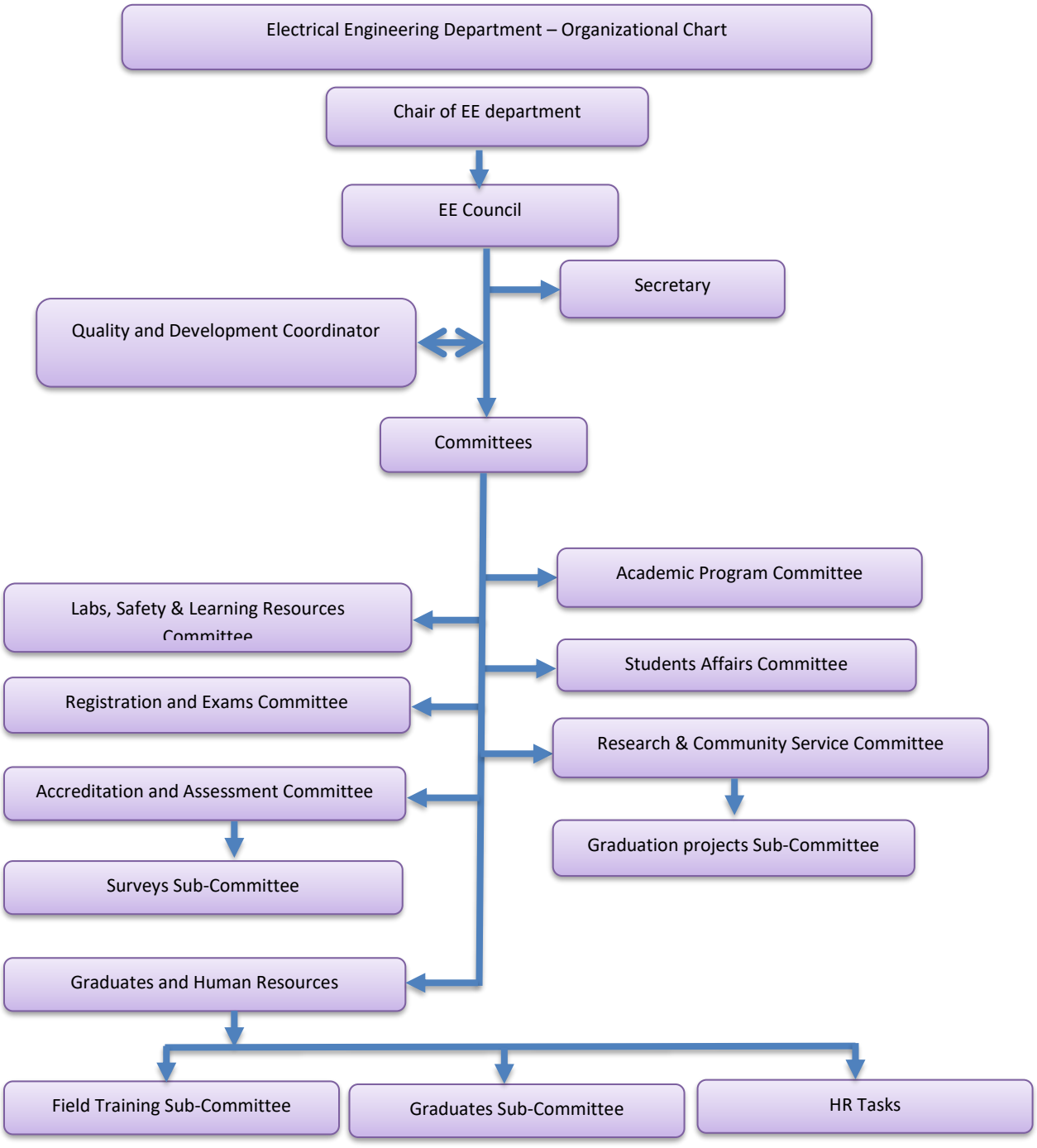

Figure 1 (b): Organization Flow chart for Electrical Engineering

Library Services

The University library (Prince Mesha'al Library) is centrally located within the University campus. Its current collections of monographs and bound periodicals exceed 310,000 volumes from more than 300 publishers. The collection is comprised of 80% in Science and Engineering and 20% in Humanities and Social Sciences. The library subscribes to 1,264 periodical titles and 1,249 electronic journals too. It also maintains 37,522 reels of journal earlier issues on microfilm. The current collection for the Electrical Engineering is 21,336 books and bound periodicals. The periodical subscription is for 26 titles. This is in addition to the subscription of the IEEE/IEE Electronic Library full-text database. This permits the user access to 1400 publications, starting from 1988 and including more than 100 technical journals, over 600 IEEE/IEE standards and about 700 Electrical Engineering conferences. The services offered by the library are summarized below:

- *Online Searching:*

The NU Library has online access through the internet to more than 600 international databases covering humanities, social sciences, sciences and engineering.

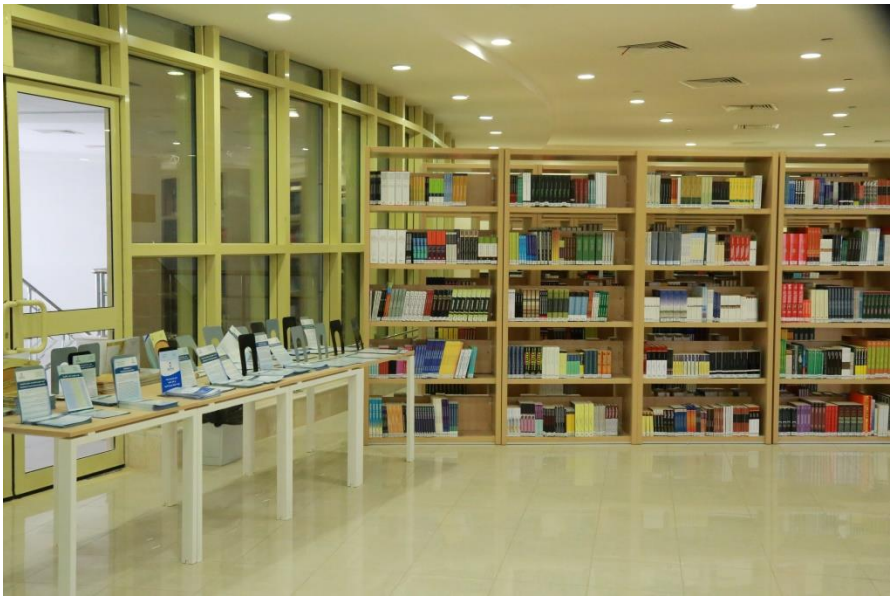

Figure 2: NU Library view

- *Book Loans and Reading in the Library:*

In addition to the online searching and use of international databases, instructors and students can go directly to the central library and borrow their books. Besides the central library, we have another departmental library for the Department of Electrical Engineering from which the instructors can easily make their loans of specialized content.

Figure 3: Sitting arrangements and view of books on shelf in Library

PROGRAM OFFERED

The Department offers Bachelor of Electrical Engineering after completion of 132 credit hours along with non-credit summer training.

Program Objectives

The graduates of EE program are prepared to achieve the following program objectives:

1. Technically compete in their respective Electrical Engineering field and conceive, design and execute broad range of Electrical Engineering tasks locally and globally.
2. Meet industry's expectations in Electrical Engineering with excellent communication and leadership skills.
3. Contribute to the society through providing innovative solutions for Electrical Engineering problems and function on multi-disciplinary teams.
4. Pursue their Electrical Engineering professional development through self-learning and advanced graduate studies if qualified and interested.
5. Uphold professional and social ethics necessary in fulfilling their responsibilities towards the Almighty, clients and the society and contribute to sustainable development of the Kingdom.

Program Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Graduate Attributes:

At the end of the program, the student will attain the following attributes:

1. Ability to apply critical thinking and decision-making skills to solve complex Electrical Engineering problems.
2. Ability to work effectively in an environment having uncertainty and risk, and a willingness to meet new challenges independently.
3. Effective use of communication skills for negotiating and creating new understandings, and interacting with others in a team environment.
4. Ability to apply professional and ethical behaviours in the workplace.
5. Ability to plan, organize, and control professional projects

The Academic Plan

The academic plan of Electrical Engineering program is shown in Table 3. Students admitted to Electrical Engineering program complete the first three semesters (level 1, level 2 and level 3) in the preparatory year program which consists of 27 credit hours including 6 credit hours in math courses, in addition to other courses. The course curriculum of Electrical Engineering program is shown in Figure 6. The curriculum consists of 132 credit hours. The curriculum covers 6 courses as general education, which is in total 12 credit hours. These Arabic language and Islamic studies courses are required by the university. Two courses with 5 credit hours are on communication skills (English language courses). The study plan includes 9 courses of 29 credit hours on math and basic sciences. These courses cover four basic sciences, such as, mathematics, physics, chemistry and geological science. These features completely fit the requirements of electrical engineering program of ABET. The curriculum also includes 31 courses of 86 credit hours on core electrical engineering. In addition, there is one course on summer field training of zero credit hours.

A flowchart that illustrates the prerequisite structure of the Electrical Engineering program is shown in figure 4 below.

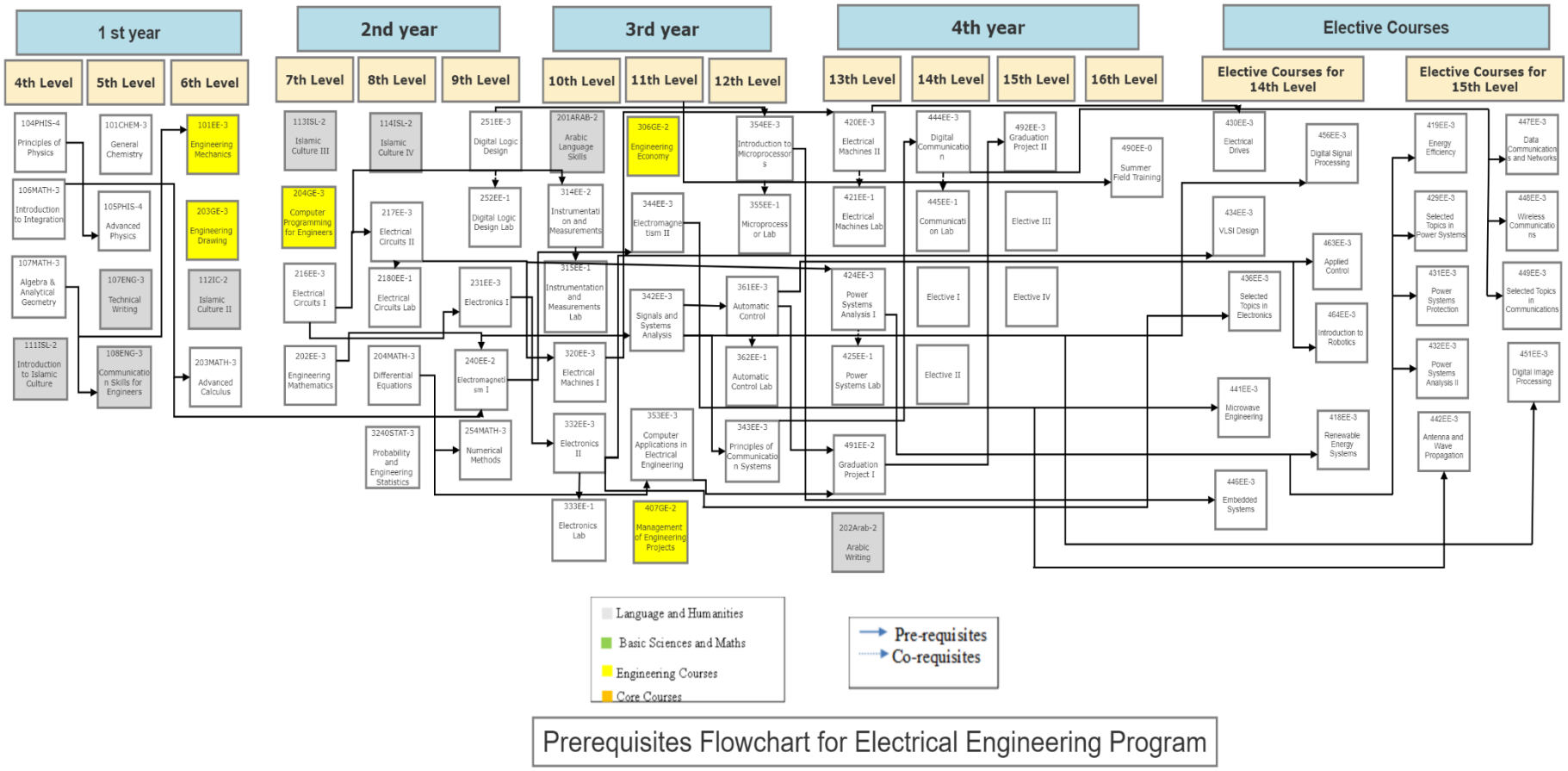

Figure 4: Prerequisites Flowchart for Electrical Engineering Program

Table 3 Curriculum of Electrical Engineering Program

No.	Curriculum Component	No. of Courses	No. of Credit Hours
1.	Preparatory Year	17	42
2.	University Requirements	27	65
3.	College Requirements	6	14
4.	Program Requirements	50	124
Total		100	245

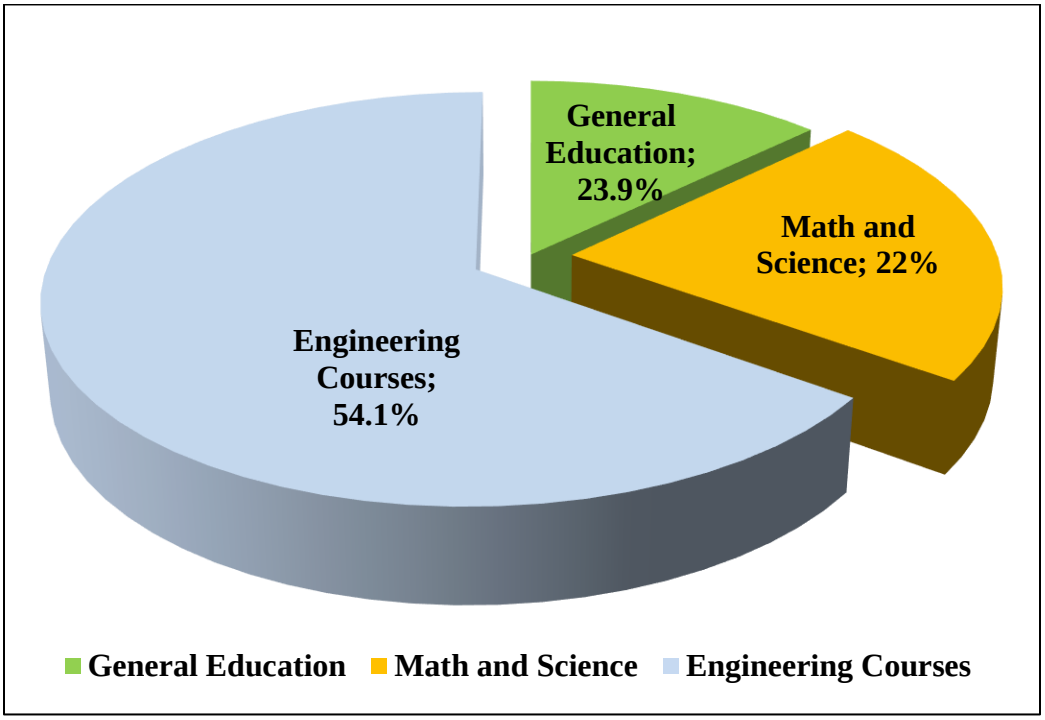

Figure 5 Distribution of Electrical Curriculum in Percentage

Table 4. General University Requirements

Prep. Year			
No.	**Course Code**	**Course Title**	**Credit Hours CR (Theory, Lab, Tut.)**
1.	140TEC-3	Computer Skills	2 (2 , 0 , 0)
2.	140MATH-2	Introduction of Mathematics	2 (2 , 0 , 0)
3.	140SKL-2	Learning, Thinking and Research Skills	2 (2 , 0 , 0)
4.	140ENG-2	English Language :Reading Skills	2 (2 , 0 , 0)
5.	141ENG-2	English Language :Writing Skills	2 (2 , 0 , 0)
6.	142ENG-2	English Language :Listening and Speaking Skills	2 (2 , 0 , 0)

7.	143ENG-2	English Language :Grammars	2 (2 , 0 , 0)
8.	150MAN-1	Occupational Ethics	1 (1 , 0 , 0)
9.	150MATH-4	Algebraic Sciences	4 (4 , 0 , 0)
10.	150SKL-2	Communication Skills	2 (2 , 0 , 0)
11.	150ENG-3	English Language: Speaking	3 (3 , 0 , 0)
12.	151ENG-2	Report Writing	2 (2 , 0 , 0)
13.	150TEC-1	Technology	1 (1, 0 , 0)
	Total		27(27 , 0 , 0)
University Requirements			
No.	**Course Code**	**Course Title**	**Credit Hours CR(Theory,Lab,Tut.)**
1.	111ISL-2	Introduction to Islamic Culture 1	2 (2 , 0 , 0)
2.	112ISL-2	Introduction to Islamic Culture 2	2 (2 , 0 , 0)
3.	201ARAB-2	Arabic Language Skills	2 (2 , 0 , 0)
4.	113ISL-2	Islamic Culture (3)	2 (2 , 0 , 0)
5.	202ARAB-2	Arabic Writing	2 (2 , 0 , 0)
6.	114ISL-2	Islamic Culture (4)	2 (2 , 0 , 0)
7.	Total		12 (12, 0, 0)
College Requirements			
No.	**Course Code**	**Course Title**	**Credit Hours CR(Theory,Lab,Tut.)**
1.	107ENG-3	Technical Writing	3 (3 , 0 , 0)
2.	108ENG-2	Communication Skills for Engineers	2 (2 , 0 , 0)
3.	Sub Total		5 (5 , 0 , 0)
Math and Science			
No.	**Course Code**	**Course Title**	**Credit Hours CR(Theory,Lab,Tut.)**
1.	101CHM-3	General Chemistry	3 (3 , 0 , 0)
2.	104PHIS-4	Principles of Physics	4 (3 , 2 , 0)
3.	106MATH-3	Introduction to Integration	3 (3 , 0 , 0)
4.	107MATH-3	Algebra & Analytical Geometry	3 (3 , 0 , 0)
5.	203MATH-3	Advanced Calculus	3 (3 , 0 , 0)
6.	105PHIS-4	Advanced Physics	4 (3 , 2 , 0)
7.	204MATH-3	Differential Equations	3 (3 , 0 , 0)
8.	324STAT-3	Probabilities and Engineering Statistics	3 (3 , 0 , 0)
9.	254MATH-3	Numerical Methods	3 (3 , 0 , 0)
10.	Sub Total		29 (27, 4 , 0)
General Engineering			
No.	**Course Code**	**Course Title**	**Credit Hours CR(Theory,Lab,Tut.)**
4.	203GE-3	Engineering Drawing	3 (2 , 2 , 0)
5.	306GE-2	Engineering Economy	2 (2 , 0 , 0)
6.	407GE-2	Management of Engineering Projects	2 (2 , 0 , 0)

7.	204GE-3	Computer Programming for Engineers	3 (2 , 2 , 0)
8.	Sub Total		10 (8 , 4 , 0)
9.	Grand Total		44 (40 , 8 , 0)
Department Requirements (Core Course)			
No.	**Course Code**	**Course Title**	**Credit Hours CR(Theory, Lab, Tut.)**
1.	101EE-3	Engineering Mechanics	3 (3, 0, 0)
2.	202EE-3	Engineering Mathematics	3 (3, 0, 0)
3.	216EE-3	Electric Circuits I	3 (3, 0, 0)
4.	217 EE-3	Electric Circuits II	3 (3, 0, 0)
5.	213 EE-1	Electrical Circuits Lab	1 (0, 2, 0)
6.	251 EE-3	Digital Logic Design	3 (3, 0, 0)
7.	252 EE-1	Digital Logic Design Lab	1 (0, 2, 0)
8.	231 EE-3	Electronics I	3 (3, 0, 0)
9.	240 EE-2	Electromagnetism I	2 (2, 0, 0)
10.	31 4EE-3	Instrumentation and Measurements	2 (2, 0, 0)
11.	31 5EE-1	Instrumentation and Measurements Lab	1 (0, 2, 0)
12.	320 EE-3	Electrical Machines I	3 (3, 0, 0)
13.	332EE-3	Electronics II	3 (3, 0, 0)
14.	333EE-1	Electronics Lab	1 (0, 2, 0)
15.	344EE-2	Electromagnetism II	2 (2, 0, 0)
16.	342EE-3	Signals and Systems Analysis	3 (3, 0, 0)
17.	353EE-3	Computer Applications in Electrical Engineering	3 (2, 2, 0)
18.	354EE-3	Introduction to Microprocessor	3 (3, 0, 0)
19.	355EE-1	Microprocessor Lab	1 (0, 2, 0)
20.	361EE-3	Automatic Control	3 (3, 0, 0)
21.	362EE-1	Automatic Control Lab	1 (0, 2, 0)
22.	343EE-3	Principles of Communication Systems	3 (3, 0, 0)
23.	420EE-3	Electrical Machines II	3 (3, 0, 0)

24.	421EE-1	Electrical Machines Lab	1 (0, 2, 0)
25.	424EE-3	Power Systems Analysis I	3 (3, 0, 0)
26.	425EE-1	Power Systems Lab	2 (0, 2, 0)
27.	444EE-3	Digital Communications	3 (3, 0, 0)
28.	445EE-1	Communications Lab	1 (0, 2, 0)
29.	491EE-2	Graduation Project I	2 (1, 2, 0)
30.	492EE-3	Graduation Project II	3 (1, 4, 0)
28	Sub Total		69 (55, 26, 0)
1	490 EE-0	Cooperation Field Training	0 (0, 0, 0)

Table 5. Study Plan for Electrical Engineering Program per Semester

	1st Year: Preparatory			
	1st Semester			
Level	**Course #**	**Course Title**	**Credits**	**Pre-Requisite**
Level 1	140ENG-2	English Language: Reading Skills	2	….
	141ENG-2	English Language: Writing Skills	2	….
	142ENG-2	English Language: Listening & Speaking Skills	2	….
	140SKL-2	Learning, thinking and Research Skills	2	….
	140TEC-2	Computer Skills	2	….
		Total Credits	**10**	
	2nd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 2	143ENG-2	English Language: Grammar	2	….
	151ENG-2	Report Writing	2	….
	140MATH-2	Introduction of Mathematics	2	….
	150SKL-2	Communication Skills	2	….
	150TEC-1	Technology	1	….
		Total Credits	9	
	3rd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 3	150ENG-3	English Language: Speaking	3	….
	150MATH-4	Algebraic Sciences	4	….
	150MAN-1	Occupational Ethics	1	….
		Total Credits	8	

		Total Credits	**11**	

	2nd Year			
	1st Semester			
Level	**Course #**	**Course Title**	**Credits**	**Pre-Requisite**
Level 4	104PHIS-4	Principles of Physics	3	--
	106MATH-3	Introduction to Integration	3	--
	107ENG-3	Technical Writing	3	--
	111ISL-2	Introduction to Islamic Culture 1	2	--
		Total Credits	**11**	
	2nd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 5	101CHM-3	General Chemistry	3	--
	105PHIS-4	Advanced Physics	3	104PHIS-4
	108ENG-2	Communication Skills for Engineers	2	
	107MATH-3	Algebra & Analytical Geometry	3	
		Total Credits	**17**	
	3rd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 6	101EE-3	Engineering Mechanics	3	107MATH-3
	203GE-3	Engineering Drawing	3	--
	112ISL-2	Islamic Culture II	2	
	203MATH-3	Advanced Calculus	3	106MATH-3
		Total Credits	**11**	

	3rd Year			
	1st Semester			
Level	**Course #**	**Course Title**	**Credits**	**Pre-Requisite**
Level 7	113ISL-2	Islamic Culture III	2	--
	204GE-3	Computer Programming for Engineers	3	
	216EE-3	Electrical Circuits I	3	106MATH-3/105PHIS-4
	202EE-3	Engineering Mathematics	3	203MATH-3
		Total Credits	**11**	
	2nd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 8	114ISL-2	Islamic Culture IV	2	--
	217EE-3	Electrical Circuits II	3	216EE-3
	213EE-1	Electrical Circuits Lab	1	217EE-3

	204MATH-3	Differential Equations	3	106MATH-3
	324STAT-3	Probability and Engineering Statistics	3	
		Total Credits	**12**	
	3rd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 9	251EE-3	Digital Logic Design	3	
	252EE-1	Digital Logic Design Lab	1	251EE-3
	231EE-3	Electronics I	3	216EE-3
	240EE-2	Electromagnetism I	2	202EE-3/ 105PHIS-4
	254MATH-3	Numerical Methods	3	204MATH-3
		Total Credits	**12**	

	4th Year			
	1st Semester			
Level	**Course #**	**Course Title**	**Credits**	**Pre-Requisite**
Level 10	306GE-2	Engineering Economy	2	
	314EE-3	Instrumentation and Measurements	2	216EE-3
	315EE-1	Instrumentation and Measurements Lab	1	314EE-3
	320EE-3	Electrical Machines I	3	217EE-3
	332EE-3	Electronics II	3	231EE-3
	333EE-1	Electronics Lab	1	332EE-3
		Total Credits	**12**	
	2nd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 11	201ARAB-2	Arabic Language Skills	2	
	344EE-2	Electromagnetism II	2	240EE-2
	342EE-3	Signals and Systems Analysis	3	202EE-3
	353EE-3	Computer Applications in Electrical Engineering	3	204GE-3
	202ARAB-2	Arabic Writing	2	
		Total Credits	**12**	
	3rd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 12	354EE-3	Introduction to Microprocessor	3	251EE-3
	355EE-1	Microprocessor Lab	1	354EE-3
	361EE-3	Automatic Control	3	342EE-3

	362EE-1	Automatic Control Lab	1	361EE-3
	343EE-3	Principles of Communication Systems	3	342EE-3
		Total Credits	**11**	

	5th Year			
	1st Semester			
Level	**Course #**	**Course Title**	**Credits**	**Pre-Requisite**
Level 13	420EE-3	Electrical Machines II	3	320EE-3
	421EE-1	Electrical Machines Lab	1	420EE-3
	424EE-3	Power Systems Analysis I	3	217EE-3
	425EE-1	Power Systems Lab	1	424EE-3
	407GE-2	Management of Engineering Projects	2	
		Total Credits	**10**	
	2nd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 14	444EE-3	Digital Communications	3	343EE-3
	445EE-1	Communications Lab	1	444EE-3
	***EE-3	Elective I	3	
	491EE-2	Graduation Project I	2	361EE-3/ 353EE-3
		Total Credits	**9**	
	3rd Semester			
	Course #	**Course Title**	**Credits**	**Pre-Requisite**
Level 15	492EE-3	Graduation Project II	3	491EE-2, 407GE-2
	***EE-3	Elective II	3	
	***EE-3	Elective III	3	
	***EE-3	Elective IV	3	
		Total Credits	**12**	

Elective I			
Course #	**Course Title**	**Credits**	**Pre- Requisite**
430EE-3	Electrical Drives	3	420EE-3
434EE-3	VLSI Design	3	332EE-3
441EE-3	Microwave Engineering	3	344EE-2
446EE-3	Embedded Systems	3	354EE-3
456EE-3	Digital Signal Processing	3	342EE-3
463EE-3	Applied Control	3	361EE-3

Elective II			
Course #	**Course Title**	**Credits**	**Pre- Requisite**
429EE-3	Selected Topics in Power Systems	3	424EE-3
431EE-3	Power Systems Protection	3	424EE-3
432EE-3	Power Systems Analysis II	3	424EE-3
442EE-3	Antennas and Wave Propagation	3	344EE-2
447EE-3	Data Communications and Networks	3	444EE-3
448EE-3	Wireless Communications	3	444EE-3
449EE-3	Selected Topics in Communications	3	444EE-3
451EE-3	Digital Image Processing	3	342EE-3
436EE-3	Selected Topics in Electronics	3	354EE-3
464EE-3	Introduction to Robotics	3	361EE-3
418EE-3	Renewable Energy Systems	3	424EE-3
419EE-3	Energy Efficiency	3	418EE-3

General University Course Description

104PHIS-4 Principles of General Physics **4 (3,2,0)**

Vectors, Newton's Laws of Motion, Work and Energy, properties of matter, and their flow, principles of heat, Static and Dynamic electricity, Sound and Optics.

101CHEM-3 General Chemistry **3 (3,0,0)**

Stoichiometry Chemical Arithmetic. Gaseous state - The liquid state – Solutions - properties of the combined solutions - Chemical equilibrium - Introduction to organic chemistry: History of organic chemistry, Chemistry of carbons, homologes series, functional groups, Hydrocarbons.

106MATH-3 Introduction to Integration **3 (3,0,0)**

Integration: indefinite integral (definition, geometric meaning, basic properties). Techniques of integral: integration by parts, trigonometric substitutions, partial fractions, quadratic expressions etc . Integration of certain classes of trigonometric functions. Definite integral: Riemann integral - Upper and lower sums, geometric meaning of definite integral, some properties of definite integral. Intermediate value theorem for integrals. Fundamental theorem of Calculus. Applications of the definite integral: area, volume, work, arc length. Approximations by the Trapezoidal and Simpson rules.

107MATH-3 Algebra & Analytical Geometry **3 (3,0,0)**

Systems of linear equations, matrices, types of matrices, algebraic of matrices, inverse of matrices, determinants, Cramer's rule. Vectors in two and three dimensions and properties of vectors, scalar

(dot) and cross products. Distance formula, gradient (or slope), positive and negative slopes, Inclination, parallel and perpendicular lines, straight line general formula, perpendicular distance from a point to a line, the general formula of circle. Conic sections: the parabola, the ellipse, the hyperbola. Rectangular, polar and spherical coordinates; curves in polar coordinates. Equations of lines and planes in space, surfaces.

107ENG-3 Technical Writing 3 (3,0,0)

Provide English Language instruction to enhance students' proficiency and enable them to understand the technical language offered in English as a medium of instruction. Build students' confidence and motivation through exposure to the technical language. Expose students to wide range of topics. Build knowledge of key vocabulary in their relevant field.

203MATH-3 Advanced Calculus 3 (3,0,0)

Infinite Sequences, Infinite series, convergence and divergence of infinite series, integral test, ratio test, root test and comparison test. Conditional convergence and absolute convergence, alternating series test. Power Series, Taylor and Maclaurin series, Vector valued functions, their limits, continuity, derivatives and integrals. Motion of particle in space, tangential and normal components of acceleration. Function in two or three variables, their limits, continuity, partial derivatives, chain Rule, directional derivatives, tangent planes and normal lines to equations, Extrema of Functions of Several Variables, Lagrange Multipliers, Double integral and its applications to area, volume, moments and center of mass. Double integrals in polar coordinates, triple integral in rectangular, cylindrical and spherical coordinates and applications to volume, the moment and center of mass. Vector fields, line integrals, surface integrals, Green's theorem, and the divergence theorem. Stoke's theorem.

Prerequisites: 106 Math-3

108ENG-2 Communication Skills for Engineers 2 (2,0,0)

Provide English Language instruction to enhance students' proficiency and enable them to understand the technical language offered in English as a medium of instruction.

Build students' confidence and motivation through exposure to the technical language. Expose students to wide range of topics. Build knowledge of key vocabulary in their relevant field.

Prerequisites: 107 ENG-3

105PHIS-4 Advanced Physics 4 (3,2,0)

Atomic structure: electronics configuration, classification of elements, energy levels. Crystal structure: lattice, symmetry, space group, examples for simple structure. Electrical properties of

materials and electricity: classification of materials. Magnetic properties of materials and magnetism. Thermal properties of materials: thermal energy, thermoelectric power (Seebeck Effect). Mechanical properties of matter (Young's modulus, tensile materials).

The experiments required for 105 PHIS (Advanced physics):

1. Decay of current in a RC circuit
2. LCR circuit.
3. Amplifiers;
4. Cicuit in series and in parallel (with Ohm's law).
5. Solar cell
6. Stefan-Boltzman's law
7. Magnetic field along the axis of coils
8. Thermal properties materials
9. Spring Constant (Hook's law).

Prerequisites: 104 PHIS-4

204MATH-3 Differential Equations 3 (3,0,0)

The course introduces basic concepts, theorems and knowledge of the linear algebra of matrices, special functions, Fourier analysis and partial differential equations with application to engineering problems. Matrices and Vectors, linear system of equations (Gauss Eliminations) - Determinates, Crammer rule, inverse of matrix Gauss, Jordan elimination - Introduction to vector differential calculus, Dot product and Cross product - Vector differential calculus, Gradient, Divergence and Curl of a vector field) - Special function, Gamma function, Beta function - Introduction to Fourier analysis, Fourier series, Fourier sine series, Fourier cosine series - Partial differential equations, Classifications and methods of solution, heat equation, wave and potential equation.

Prerequisites: 106 Math-3

254MATH-3 Numerical Methods 3 (3,0,0)

Types of errors, errors analysis. Numerical solutions of nonlinear equations of single variables: fixed point iteration method, bisection method, false position method, Newton-Raphson method, secant method. Numerical solutions of a system of linear equations: Gauss Jordon iterative method. Gauss-Jordon iterative method with partial and complete pivoting. Interpolation: Lagrange interpolation formula, divided differences, Newton interpolation, Numerical differentiation. Numerical integration. Introduction to numerical solutions of ordinary differential equations.

Prerequisites: 204Math-3

324STAT-3 Probability and Engineering Statistics 3 (3,0,0)

Concepts of statistics and its applications in science and engineering, measure of central tendency, measure of dispersion, regression, correlation, and their applications. Concepts of probability and its applications in science and engineering, probability axioms, conditional probability, independent probability for events, some probability distributions and random variables: discrete and continuous random variables, distributions for applications in engineering such as Poison and Weibull distributions and other probability distributions are important for engineers, time series, and computer applications using statistical software.

111ISL-2 Introduction to Islamic Culture 2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well-known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community.

112ISL-2 Islamic Culture II 2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well-known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community.

201ARAB-2 Arabic Language Skills 2 (2,0,0)

تعريف الكلمة: لغة واصطلاحا. أقسام الكلمة: اسم، وفعل، وحرف. علامات الاسم: (أل) التعريف، التنوين، والحديث عنه. أقسام الاسم من حيث الإعراب والبناء: معرب، ومبني. أقسام الفعل: ماض، وأمر، ومضارع. العلامة التي يعرف بها كل فعل، وحكمه من حيث الإعراب والبناء. تعريف الكلام. صور ائتلاف الكلام ست. تعريف الإعراب، وبيان أنواعه، مع بيان ما يشترك فيه الاسم والفعل، وما يختص به كل واحد منهما، وبيان العلامات الأصول والفروع. مما خرج عن الأصل في إعرابه سبعة أبواب:

خمسة في الأسماء:
الأسماء الستة، المثنى وما ألحق به، جمع المذكر السالم وما ألحق به، الجمع بالألف والتاء المزيدتين وما ألحق به في حالة النصب، الممنوع من الصرف في حالة الجر.

واثنان في الأفعال:
الأفعال الخمسة، الفعل المضارع المعتل الاخر في حالة الجزم. الصرف: الميزان الصرفي – المجرد والمزيد. المعاجم: طريقة الكشف في المعاجم العربية المختلفة. الأدب والنصوص: من القرآن لكريم سورة الحجرات من أولها إلى آخر الآية رقم (12)

من الحديث الشريف: خطبة الوداع، أو بعض الأحاديث المختارة ذات التوجيه الاجتماعي والسلوكي. من الشعر والنثر: مختارات شعرية ونثرية تمثل الأدب العربي.

113ISL-2 Islamic Culture III 2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well-known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community.

202ARAB-2 Arabic Writing 2 (2,0,0)

اصطلاحا. أقسام الكلمة: اسم، وفعل. وحرف تعريف الكلمة: لغة،

عالمات االسم :)ال(التعريف، التنوين، والحديث عنه. أقسام االسم من حيث اإلعراب والبناء :معرب، ومبني. أقسام الفعل : ماض، وأمر، ومضارع .العالمة التي يعرف بها كل فعل، وحكمه من حيث اإلعراب والبناء .تعريف الكالم .صور ائتالف الكالم ست .تعريف اإلعراب، وبيان أنواعه، مع بيان ما يشترك فيه االسم والفعل، وما يختص به كل واحد منهما، وبيان العالمات ألصول والفروع. مما خرج عن ألصل في إعرابه سبعة أبواب :خمسة في ألسماء ألسماء الستة المثنى وما ألحق به جمع المذكر السالم وما ألحق به الجمع باألل والتاء المزيدتين وما ألحق به في حالة النصب الممنوع من الصرف في حالة الجر .واثنان في ألفعال : ألفعال الخمسة الفعل المضارع المعتل آلخر في حالة الجزم .الصرف : الميزان الصرفي المجرد والمزيد –المعاجم : طريقة الكشف في المعاجم العربية المختلفة .ألدب والنصوص : من القرآن الكريم سورة الحجرات من أولها إلى آخر آلية رقم 22 من الحديث الشريف : خطبة الوداع، أو بعض ألحاديث المختارة ذات التوجيه االجتماعي والسلوكي .من الشعر والنثر : مختارات شعرية ونثرية تمثل ألدب العربي.

114ISL-2 Islamic Culture IV 2 (2,0,0)

Believes based on scientific basis and methodologies deduced from the Holy Qur'an, Biography of Prophet Muhammad, Peace be upon him (PBUH), and other well-known Islamic references. The concept of ethics in Islam. The rules of Islam in dealing with instincts through ethics and moral rules.

The Islamic ethics and values necessary for their daily life. Explain that Islam is a religion that takes care of both daily life and the hereafter through solid historical examples. The Islamic solutions for daily life problems. Explain the effect of applying the Islamic ethics and values on community

College Courses Descriptions

203GE-3 Engineering Drawing **3 (2,1,0)**

Introduction to drawing, Drawing equipment and use, Skills of Freehand Sketching, Methods of Projection: Orthographic, Isometric Dimensioning of View. Third View Prediction, Primary and Successive Auxiliary Views. Intersections of Surfaces and Bodies. Development of Surfaces. Sectioning. Introduction to Assembly Drawings. Introduction to computer graphics, Engineering Applications.

204GE-3 Computer Programming for Engineers **3 (2,1,0)**

Computer Algorithms; Developing Algorithms; Programming Preliminaries; Simple computer Programs; Numeric Constants and Variables; Arithmetic Expressions; Input and Output in C Programs; Conditional statements; Implementing loops in Programs; Defining and Manipulation Arrays; Logical Expressions and More Control statements; C Programs Examples; Functions; Enumerated data Type and stacks; Structures; Pointer Data Type and its Applications; Lists and Trees; Recursion; Bit level Operations and Applications;

306GE-2 Engineering Economy **2 (2,0,0)**

Introduction to Engineering economy. Interest formulas and equivalence. Bases for comparison of alternatives. Decision making among alternatives. Evaluating replacement alternatives. Break even and minimum cost analysis. Cost accounting. Depreciation. Economic analysis of operations. Economic analysis of public projects. Basic management process approach, strategies and planning methods, project planning and scheduling, Bar chart, critical path methods, PERT method, resource leveling and allocation, time cost trade off. Construction and organizational approaches, leadership elements and decision-making, computer applications.

407GE-2 Management of Engineering Projects **2 (2,0,0)**

Characteristics of Construction Industry; project delivery systems; the design and construction process; construction contracting; construction planning; project control, conceptual cost estimation; and Quality and Safety Management.

Prerequisites: 306GE-2

Departmental Course Descriptions

101EE-3 Engineering Mechanics **3 (3,0,0)**

Statistics:

Forces and moments for planar systems; Basic equilibrium conditions; Centroids; Friction; Area and mass moments of inertia; Kinematics of a particle: rectilinear and curvilinear motion;

Dynamics:

Kinetics and Kinematics of particles and rigid body: Newton's law, work and energy; Relative velocity and acceleration; translation, fixed axis rotation, general motion, work and energy.

Pre-requisite: 107MATH-3

202EE-3 Engineering Mathematics **3 (3,0,0)**

Vector analysis including vector fields, gradient, divergence, curl, line and surface integrals, Gauss' and Stokes' theorems. Introduction to complex variables, eigenvalues and eigenvectors. Commonly used engineering functions, series and sequences.

Pre-requisite: 203MATH-3

216EE-3 Electric Circuits I **3 (3,0,0)**

Basic circuit elements and concepts; Basic laws of circuit theory: Ohm's law, Kirchhoff's law; Circuit theorems: superposition principle, Thevenin and Norton theorems; maximum power transfer theorem Techniques of circuit analysis: Nodal and mesh analysis; Sinusoidal sources and the concept of phasor in circuit analysis; Introduction to concept of active, reactive, complex power and power factor.

Pre-requisite: 106 MATH-3 and 105PHIS-4.

213EE-1 Electric Circuits Lab **1 (0,2,0)**

In this course students will perform experiments to verify practically the theories and concepts learned in 216EE-3 and 217EE-3. This lab course introduces circuit using Ohm's law, KVL, KCL, Superposition, Thevenin's and Maximum power transfer theorems in DC circuits. Topics include

also AC circuits, resonant circuits, transient response of 1st order circuits, magnetically coupled circuits and three phase circuits.

217EE-3 Electric Circuits II **3 (3,0,0)**

Time domain transient responses for first and second order circuits, Resonance in Series and parallel AC circuits, Frequency domain analysis: bode plots and passive filters, Magnetically coupled circuits, Two port networks, Analysis of three-phase circuits with balanced conditions.

Pre-requisite: 216EE-3

251EE-3 Digital Logic Design **3 (3,0,0)**

Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems, decoders, multiplexers, adders and subtractors. Types of flip-flops. Sequential circuit analysis and design. VHDL and its application in basic gates.

252EE-1 Digital Logic Design Lab **1 (0,2,0)**

Number systems & codes. Logic gates. Boolean algebra. Karnaugh maps. Analysis and synthesis of combinational systems, decoders, multiplexers, adders and subtractors. Types of flip-flops. Sequential circuit analysis and design. Simulation of basic gates (OR, NOT) using VHDL.

Co-requisite: 251EE-3

231EE-3 Electronics I **3 (3, 0, 0)**

This course introduces students to discrete semiconductor devices. It covers essential topics from basic semiconductor theory through to the application of diodes and transistors. It focuses the P-N junction and the Diode as a circuit element, the Bipolar Junction Transistor (BJT) as a circuit device, the Single stage BJT amplifier circuits, the Junction Field-Effect-Transistor (JFET) and the Metal Oxide Semiconductor Field Effect Transistor (MOSFET) as circuit element.

Pre-requisite: 216EE-3

240EE-2 Electromagnetism I **2 (2,0,0)**

Electrostatics: Coulomb's law, Electric flux density, Gauss's law and applications, Electric potential, Electric dipole, Current density and conductors, Polarization in Dielectrics, Boundary conditions, Poisson's and Laplace’s equations, Resistance, Dielectrics and Capacitance, Image method. Magnetostatics: Biot-Savart law, Ampere's circuit law and applications, Magnetic flux density, Maxwell's equations for static fields, Magnetic scalar and vector potentials.

Pre-requisite: 202EE-3

314EE-2 Instrumentation and Measurements **2 (2, 0, 0)**

Measurement fundamentals: units and errors, statistical analysis: DC and AC analog digital meters constructions :DC and AC bridge : Oscilloscope: CRT, trigger sweep circuits: Oscilloscopes, Analog and Digital Multi meters to measure electrical parameters: Transducers and sensors; passive and active : specifications of Spectrum analyzer, Liquid crystal displays (LCDs) and optical fiber sensor.

Pre-requisite: 216EE-3

315EE-1 Instrumentation and Measurements Lab **1 (0, 2, 0)**

Measurement fundamentals: units and errors, statistical analysis: DC current and voltage measurement, Use of Oscilloscope, Use of bridge circuit.

Co-requisite: 314EE-2

320EE-3 Electric Machines I **3 (3, 0, 0)**

Transformers (construction, operation of single-phase transformers, equivalent circuit, voltage regulation and efficiency, auto – transformers, three-phase transformers), AC machinery fundamentals, three-phase induction machines (construction, operation, equivalent circuit, performance calculations, starting of induction motors), small AC motors (single-phase induction motors).

Pre-requisite: 217EE-3

332EE-3 Electronics II **3 (3, 0, 0)**

This course is a continuation of 231EE-3 course. It focuses the analysis of amplifier frequency response, the operational amplifiers design and applications, the power Amplifiers and the feedback concept and oscillator circuits.

Pre-requisite: 231EE-3

333EE-1 Electronics lab **1 (0,2,0)**

This lab performs experimentation in basic electronic circuits and devices: Diodes, transistors (BJT, FET), DC and small signal AC Analysis, Amplifier configurations. It is equipped with basic electronics equipment package such as digital oscilloscopes, DMM, DC power supply units and function generators.

Co-requisite: 332EE-3

344EE-2Electromagnetism II **2 (2,0,0)**

This course covers forces due to magnetic fields, magnetic torque and moment, Magnetic dipole, magnetic boundary conditions, Inductors and inductances, magnetic energy and circuits. Time varying fields: Faraday's law, Transformer and motional emfs, Displacement current, Maxwell's equations and time harmonic fields, Wave equation, Power transfer and Poynting vector, Plane wave propagation in free space, in lossy dielectrics and in good conductors, Reflection of plane wave at normal and oblique incidences.

Pre-requisite: 240EE-2.

342EE-3 Signals and systems Analysis **3 (3, 0, 0)**

Motivation, Signal Classifications, Signal Operations, Eigen Functions; Theories of Fourier series for continuous and discrete time signals, Linear circuits and system concepts, impulse response, convolution and transfer function; Frequency response of systems, Fourier Transform, Laplace transform and z-transform with applications; Nyquist theorem for sampling of analog signals.

Pre-requisite: 202EE-3

353EE-3 Computer Applications in Electrical Engineering **3 (2, 1, 0)**

Introduction to MATLAB system, generate matrices and perform operations on them, plot data, annotate graphs, create scripts and functions, construct and manipulate data structures, set up basic data analysis. Interacting Simulink Software with MATLAB, Creating a Simulink Model, Modeling a Dynamic Control System.
Introduction to LabVIEW virtual instruments (VIs), LabVIEW environments, creating, editing and debugging a VI, creating a sub VI, loops and charts, arrays, graphs, clusters, case and sequence structures, formula nodes.

Pre-requisite: 204GE-3

354EE-3 Introduction to Microprocessors **3 (3, 0, 0)**

Microprocessors architecture; Addressing modes and techniques; Instruction set; Assembly language programming; Interrupt systems; Input/output devices and timing; Memory devices; Future trends in microprocessors

Pre-requisite: 251EE-3

355EE-1 Microprocessor Lab **1 (0, 1, 0)**

Microprocessors architecture; Addressing modes and techniques; Instruction set; Assembly language programming; Interrupt systems; Input/output devices and timing; Memory devices; Future trends in microprocessors

Co-requisites: 354EE-3

361EE-3 Automatic Control **3 (3, 0, 0)**

Review of mathematical background (complex variables, Laplace, Diff. Equations); System representation (block diagram, transfer functions, signal flow graph) Modeling of electric and mechanical systems; State variable analysis; Stability; Time domain analysis; Root locus; Frequency domain analysis; Introduction to PID control

Pre-requisite: 342EE-3

362EE-1 Automatic Control Lab **1 (0, 1, 0)**

Experiments to support control theory using physical processes (e.g. water level, temperature control, light intensity control, etc); Control system simulation using Matlab; Modeling of physical (experimental) equipment; Static performance; Transient analysis; Measuring devices; Two-position control; Proportional control; PID control;

Pre-requisite: 361EE–3

343EE-3 Principles of Communications Systems **3 (3 , 0 , 0)**

This course covers fundamental concepts of communication systems, which are essential for the understanding of advanced courses in digital/ wireless communications. Beginning with basic elements of Communication systems and Transmission through Systems and channels, the course will also cover several important modulation techniques such as Amplitude Modulation, Frequency Modulation, Phase Modulation etc., Superheterodyne receiver, Sampling process and Quantization, including Nyquist criterion and reconstruction of the original signal from the sampled signal, Pulse Modulation (PAM, PWM, PPM); TDM; Pulse Code Modulation (PCM); DPCM and DM. Further, the course will also cover concepts and advantages of Digital Communications, Line Coding (Binary Signaling), as well as Introduction to Digital Modulation (ASK, FSK, PSK).

Pre-requisite: 342EE-3

420EE-3 Electrical Machines II **3 (3, 0, 0)**

Synchronous machines (construction, internal voltage, equivalent circuit, Phasor diagram, performance of turbo-alternator, generator operating alone, parallel operation of AC generators, synchronous motor, steady-state operation, starting), DC machines (construction, classification, performance, motor characteristics, starting of DC motors, speed control of DC motors).

Pre-requisite: 320EE-3

421EE-1 Electrical Machines Lab **1 (0, 1, 0)**

Hands-on exercises to set up circuits along with measurement and observation capabilities to explore the operating principles and characteristics of transformers, DC and AC Motors and Generators.

Pre-requisite: 420EE-3

424EE-3 Power Systems Analysis I **3 (3, 0, 0)**

Power system components and representation; Transmission line and cable parameters; Analysis of transmission and distribution lines; Electric insulators; Grounding systems; High voltage surges

Pre-requisite: 217EE-3

425EE-1 Power Systems Lab **1 (0, 1, 0)**

This lab course includes ten experiments to study various aspects of power systems: measurement of the characteristics data of a transmission line and an assessment of its voltage drop and losses; synchronization and steady state operation of a generator connected to an infinite bus system; load characteristics of a synchronous motor and effect of field excitation on reactive power load; effect of voltage levels on power transmission and effects of various load types on power plants; load flow data preparation and system study; analysis of symmetrical and unsymmetrical faults; power factor correction; performance and connections of power transformers.

Pre-requisite: 424EE-3

444EE-3 Digital Communication **3 (3, 0, 0)**

This course provides student with basics and advanced techniques for digital communication, which are the basic elements of modern communication systems. It presents the basic elements to implement any communication system and different digital technique such as source coding, channel coding, digital modulation and detection, noise and wireless channel. Examples of modern Communication Systems.

Pre-requisite: 343EE-3

445EE-1 Communications Lab **1 (0, 1, 0)**

Experiments on signal representation and filtering, amplitude modulation and demodulation, delta modulation (DM) and demodulation, frequency modulation and detection, sampling and quantization, pulse amplitude modulation (PAM), pulse code modulation (PCM) and demodulation, Time Division Multiplexing (TDM).

Pre-requisite: 444EE-3

491EE-2 Graduation Project I **2 (1, 1, 0)**

The graduation project is a culminating handy course work for which the students are expected to integrate and apply what they have learned through previous academic work and field experiences, with faculty supervision. These projects may be "new," continuation of work done in previous courses; or may be projects started in a previous course that become significantly expanded and enhanced for the thesis. It has two phases- to be taken in consecutive two semesters at senior level.

At the beginning of the semester, the students propose a topic on which they are supposed to work as a group. Project students meet in class weekly, discuss their research, and screen their progresses for peer and faculty critique and suggestions. At the end of the semester, students present their thesis projects to the supervising committee.

Pre-requisite: 353EE-3; 361EE-3

492EE-3 Graduation Project II **3 (1, 2, 0)**

The graduation project is a culminating handy course work for which the students are expected to integrate and apply what they have learned through previous academic work and field experiences, with faculty supervision. This is the continuation of graduation project-I, and consequently graduation project-II is supposed to be taken in the consecutive semester.

Throughout the semester, the students try to implement what they proposed in graduation project-I as a group. Project students meet in class or lab weekly, segregate the work into sub-projects, integrate the individual works in order to reach their target, and faculty critique and suggestions. At the conclusion of the semester, students present their design projects along with the thesis to the supervising committee.

Pre-requisite: 491EE-2

490EE-0 Field Training **0(0, 3, 0)**

Describe the major student activities taking place during the field experience. Eight weeks of training in industry under the supervision of a college member. Students have to submit a report about their achievements during training in addition to any other requirements assigned by the Department.

Pre-requisite: After completion of 11th Level

Elective Courses

Elective Courses for 14th Semester

430EE-3 Electric Drives **3 (3, 0, 0)**

Principles of electric drive; Definitions; Electrical considerations: running, starting, braking; Mechanical considerations: type of enclosure, noise, drive transmission, motor selection; Electric traction; DC & AC solid state drives.

Pre-requisite: 420EE-3.

434EE-3 VLSI Design **3 (3, 0, 0)**

Introduction to Integrated Circuit, Lambda Design Rules, NMOS and CMOS Inverters, NMOS and PMOS transistors, P -Well process, N -Well process, CMOS logic, CMOS Technologies, CMOS fabrication and Layout, Integrated Circuit Design using Verilog/VHDL.

Pre-requisite: 332EE-3.

441EE-3 Microwave Engineering **3 (3, 0, 0)**

Theory, analysis and design of transmission lines, transmission line propagation, impedance matching techniques using smith chart, waveguides, microwave network analysis using S-Parameters, analysis and design of passive and active components, measurement techniques and application of microwave systems.

Pre-requisite: 344EE-3.

446EE-3 Embedded System Design **3 (3, 0, 0)**

This course covers the main elements of embedded systems design. Emphasis given includes hardware and firmware design, hardware selection, hardware testing, development tools and software, firmware development and firmware debugging.

Pre-requisite: 354EE-3.

456EE-3 Digital Signal Processing **3 (3, 0, 1)**

Review of discrete-time signals and systems; The Discrete-Time Fourier transform, Fast Fourier Transform, Z Transform, Recursive and no recursive digital filters design and realization; Decimation and interpolation; Applications of digital signal processing in communications.

Pre-requisite: 342EE-3

463EE-3 Applied control **3 (3, 0, 0)**

Basics of system modeling and analysis; PID controller design; Transducers and actuators; Real-time control; Control applications (power systems, robotics, etc.), Introduction of Programming Logic Controller (PLC).; Control design project**.**

Pre-requisite:361EE-3.

Elective Courses for 15th Semester:

431EE-3 Power Systems Protection **3 (3, 0, 0)**

The course provides comprehensive concepts of power system protection including an understanding of the principles of the operation of protection system components, e.g. fuses, relays, circuit breakers, instrument transformers and their applications for the design of protection systems for transmission lines, busbars, motors, generators and transformers.

Pre-requisite:424EE-3.

432EE-3 Power Systems Analysis II **3 (3, 0, 0)**

This course is a continuation of 424EE-3, and provides students with a working knowledge of power system problems and computer techniques used to solve some of these problems. Topics covered include: power system components and modeling, optimal dispatch of generation, symmetrical three-phase faults, symmetrical components, unsymmetrical faults, power flow, power system stability.

Pre-requisite:424EE-3.

442EE-3 Antennas and Wave Propagation **3 (3, 0, 0)**

Introduction to antennas, theory of wave propagation, fundamental parameters of antenna, radar range equation, half-wave dipole antenna, antenna arrays, planar antennas, broadband antennas, methods of antenna measurements, matching techniques, principle of designing different types of antenna and antenna arrays.

Pre-requisite:344EE-3.

447EE-3 Data Communications and Networks **3 (3, 0, 0)**

Network Architectures. Network Layers: OSI Model and TCP/IP Model. Physical Layer Protocols and Digital Transmission Fundamentals. Data Link Layer Protocols. Network Layer Protocols: IP Protocols. Medium Access Control systems. Packet Switching and Circuit Switching. Routing in Packet Switching Network Architectures. Network Layers: OSI Model and TCP/IP Model. Physical Layer Protocols and Digital Transmission Fundamentals. Data Link Layer Protocols. Network Layer Protocols: IP Protocols. Medium Access Control systems. Packet Switching and Circuit Switching. Routing in Packet Switching. Network security.

Pre-requisite: 444EE-3.

448EE-3 Wireless Communications **3 (3, 0, 0)**

Network Architectures. Network Layers: OSI Model and TCP/IP Model. Physical Layer Protocols and Digital Transmission Fundamentals. Data Link Layer Protocols. Network Layer Protocols: IP Protocols. Medium Access Control systems. Packet Switching and Circuit Switching. Routing in

Packet Switching Network Architectures. Network Layers: OSI Model and TCP/IP Model. Physical Layer Protocols and Digital Transmission Fundamentals. Data Link Layer Protocols. Network Layer Protocols: IP Protocols. Medium Access Control systems. Introduction to wireless communications, Channel models, Large and small scale fading, Diversity, cellular system analysis (frequency planning, capacity, sectorization, etc.), Link budget analysis, Multiple access techniques (TDMA, FDMA, CDMA), technology and applications of satellite communications, Standards of wireless communications. Packet Switching and Circuit Switching. Routing in Packet Switching. Network security.

Pre-requisite: 444EE-3.

451EE-3 Digital Image Processing **3 (3 , 0 , 0)**

Fundamentals; review of DSP algorithms such as DFT; intensity transforms, frequency domain filtering; image restoration and reconstruction; color image processing; multiresolution processing; image compression; morphological image processing

Pre-requisite: 342EE-3.

464EE-3 Introduction to Robotics **3 (3 , 0 , 0)**

This course provides an overview of the robotics, basic elements of the robot, basics of the robot design, programming and vision in robotics and applications of robots in biomedical, deep water and manufacturing

Pre-requisite: 361EE-3.

418EE-3 Renewable Energy Systems **3 (3 , 0 , 0)**

Introduction, Energy and Civilization, Distributed Generation Technologies & Economics, Fundamentals of Solar Power Systems, Concentrated Solar Power, Fundamentals of Wind Power Systems, Energy Storage, Integration of Distributed Generation into the Grid, Impact of Distributed Generation on Power System Operation, Applications.

Pre-requisite: 424EE-3.

419EE-3 Energy Efficiency **3 (3 , 0 , 0)**

This course will provide the student with a practical understanding of the energy efficiency measures which can be implemented by large and medium industrial and commercial energy users, and domestic users. It will cover energy technologies including energy auditing, rate structures, economic evaluation techniques, lighting efficiency improvement, HVAC optimization, combustion and use of industrial waste, steam generation and distribution system performance, process energy management, and maintenance considerations.

Pre-requisite: 418EE-3.

FACULTY AND STAFF

The Electrical Engineering Department has good number of faculty members having Ph.D in different specialization in electrical and electronics field. The name of the faculty members with their specialization and designation is mentioned in the table below:

Table 6: List of Faculties with Qualifications and Designation in Electrical Engineering Department

Faculty Name	Qualification and Specialization	Designation	E mail
Abdullah S. Alwadie	PhD in Electrical Engineering, 2003 Specialization: Control	P	alwadie@hotmail.com
Saleh Salim Saleh Almasabi	PhD in Electrical Engineering, 2019 Specialization: Power Systems Applications, State Estimation, Reliability, Optimization, Machine Learning	AST	ssalmasabi@nu.edu.sa
Turki Mohammad Nafal Alsuwian	PhD in Electrical Engineering, 2018 Specialization: Power control, Applied control	AST	tmalsuwian@nu.edu.sa

Adam Reda Hasan Alhawari	PhD in Communications Engineering, 2012 Specialization: Wireless Communications Engineering	ASC	aralhawari@nu.edu.sa
Abdullkarem Hussein Mohammed Almawgani	PhD in Communication Engineering, 2011 Specialization: Wireless Communication Engineering	ASC	ahalmawgani@nu.edu.sa
Saifur Rahman Masihur Rahman	Ph.D in Electronics and Communication Engineering, 2015 Specialization: Sensors (Electronic Nose)	ASC	srrahman@nu.edu.sa
Muhammad Irfan	PhD in Electrical and Electronics Engineering, 2016 Specialization: Control and Automation	ASC	miditta@nu.edu.sa
Mohammad Saeed Hussain Jalalah	PhD in Electrical and Electronics Engineering, 2018 Specialization: Nano-materials and Electronic Devices	ASC	msjalalah@nu.edu.sa
Hisham Abdullah Alghamdi	PhD in Electrical Engineering, 2016 Specialization: High Voltage	ASC	haalghamdi@nu.edu.sa
Ayman Taher Ali Hindi	PhD in Electrical Engineering, 2004 Specialization: Power	AST	athindi@nu.edu.sa

Salim Nasar Mursal	PhD in Radio Engineering, 2005 Specialization: Radio EDA	AST	snmursal@nu.edu.sa
Hasan Mohammad Dahman Alqadi	PhD in Electrical and Electronics Engineering, 2019 Specialization: Nano-materials and Electronic Devices	AST	hmalgradi@nu.edu.sa
Ahmad Saeed Yahya Alzahrani	PhD in Electrical Engineering, 2018 Specialization: Power Electronics	AST	asalzahrani@nu.edu.sa
Belqasem Hassan Aljafari	PhD in Electrical and Electronics Engineering in 2019. Specialization: Renewable Energy (Power Electronics)	AST	bhaljafari@nu.edu.sa
Muhammad Tarik Kareri	PhD in Electrical and Electronics Engineering in 2022. Specialization: Nanomaterials & Renewable Energy	AST	tmkareri@nu.edu.sa
Seif Shebl Seif	Ph.D in Electrical Engineering, 2016 Specialization: Communication Engineering	AST	ssseif@nu.edu.sa
Fahad Alkahtani	M.Sc. in Electrical Engineering, 2012 Specialization: Power Electronics	L	fsalkahtani@nu.edu.sa

Mosfer Abdullah Alnajrani	M.Sc in Electrical Engineering, 2020	L	maalnajrani@nu.edu.sa
Ali Saieed ALqahtani	M.Sc in Electrical Engineering, 2019	TA	asqahtani@nu.edu.sa

1. Code: P = Professor ASC = Associate Professor AST = Assistant Professor L = Lecturer

TA= Teaching Assistant

Facilities (Offices, Classrooms and Laboratories):

Offices Facilities:

The Electrical engineering department occupies the part of three floors in the College of Engineering building within Najran University campus. There are number of offices for Faculty members, one secretariat room, one conference room and eight laboratories. Each staff member has office with space ranging from 6 to 12 square meters. Office size allows enough space for individual and collective work including the possibility to hold meetings with at most two to three colleagues or students. All facilities that needed are available for each office. Sample of faculty members' office is shown in the figure below.

Figure 6 Sample of Electrical Engineering faculty office

Classrooms Facilities:

The College of Engineering provides excellent teaching classrooms. Classrooms are adequately equipped with chairs and desks, instructor desk, interactive data show, and a white board. Each classroom is equipped with a wireless network allowing instructors to use internet. There are 23 classrooms available each with capacity of 30 students (Fig.7) and 2 large-size classrooms each with capacity of 60 students (Fig.8), also there are two amphitheaters with capacity of 150 students with high audio and video facilities.

Figure 7 Picture showing a typical small classroom

Figure 8 Picture showing a typical large class room

LABORATORY FACILITIES

The EE department is one of the largest departments in the university. The department has adequate number of laboratories for teaching and research work. Teaching laboratories are equipped with all necessary equipment to facilitate running the experimental work to enhance student's understanding of the material. Qualified technicians look after these laboratories by preparing experiments, fixing equipment, copying lab manuals, etc. Also currently there is a research laboratory supervised by some faculty members to carry out research in their specialization area and it also supports final year project activities.

Electrical Power Laboratory

This laboratory assists the students to study drives, transmission and distribution lines and modern powers system.

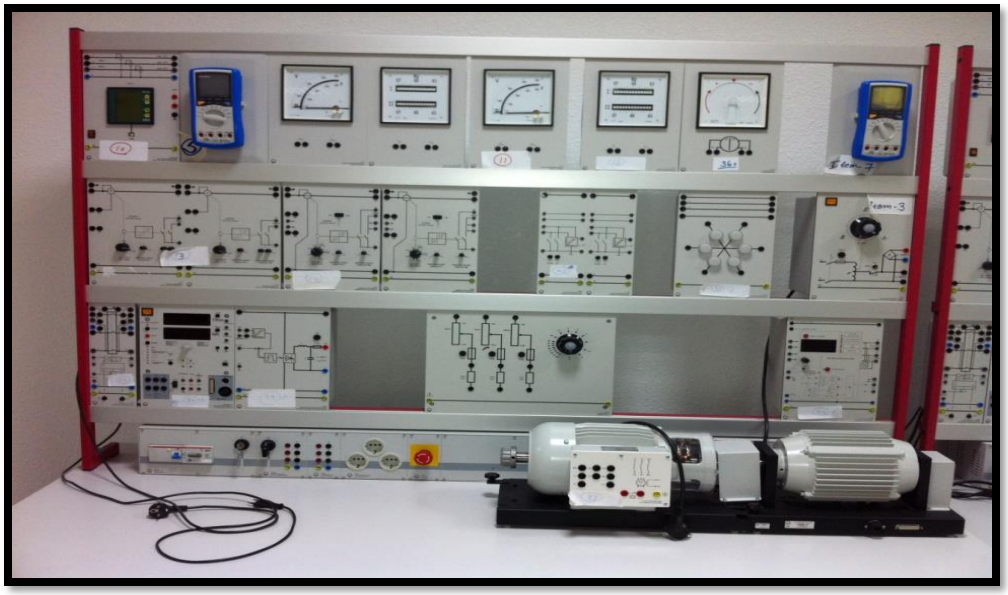

Figure 9 A partial view of the Electrical Power and Machines laboratory

Communication Laboratory

This lab is used by the students to perform different experiments related to antennas, wave propagation, analog and digital communication and microwave technology

Figure 10 A partial view of the Communications laboratory

Electrical Circuit Laboratory

This lab is used by the students to perform all electrical circuit experiments including AC and DC circuits.

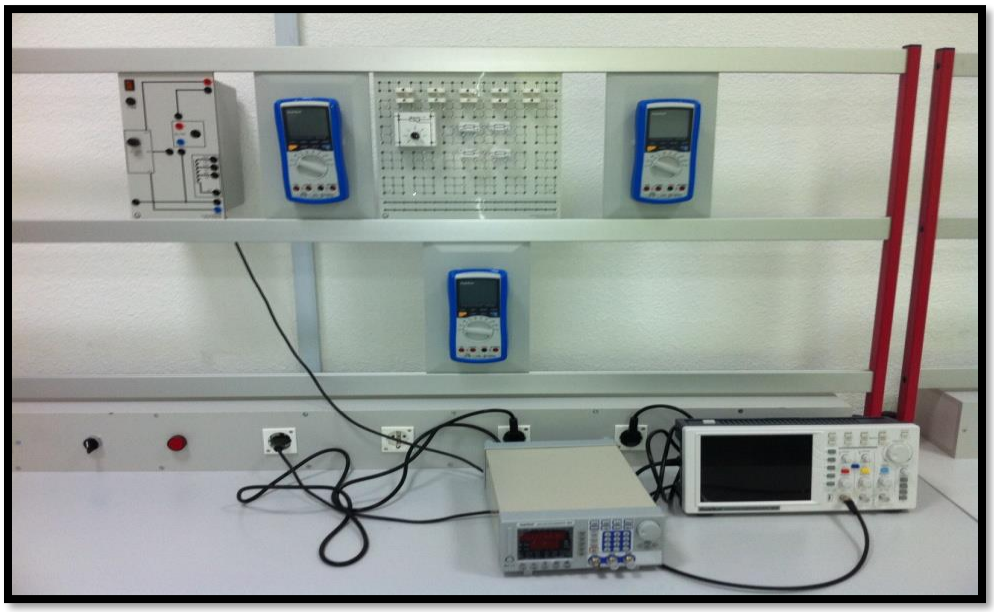

Figure 11 A partial view of the Electric Circuit laboratory

Electronics Laboratory

In this lab the students learn electronic circuits experiments.

Figure 12 An overall view of the Electronics laboratory

Control Laboratory

This lab is used to perform experiments related to control using MATLAB Simulink, Cassy-Lab and PLC.

Figure 13 A partial view of the Automatic Control laboratory

Microprocessor and Microcontroller Laboratory

Experiments related to digital logic design and 8086 microprocessors and microcontrollers are performed in this lab.

Figure 14(a) A partial view of the Microprocessor laboratory

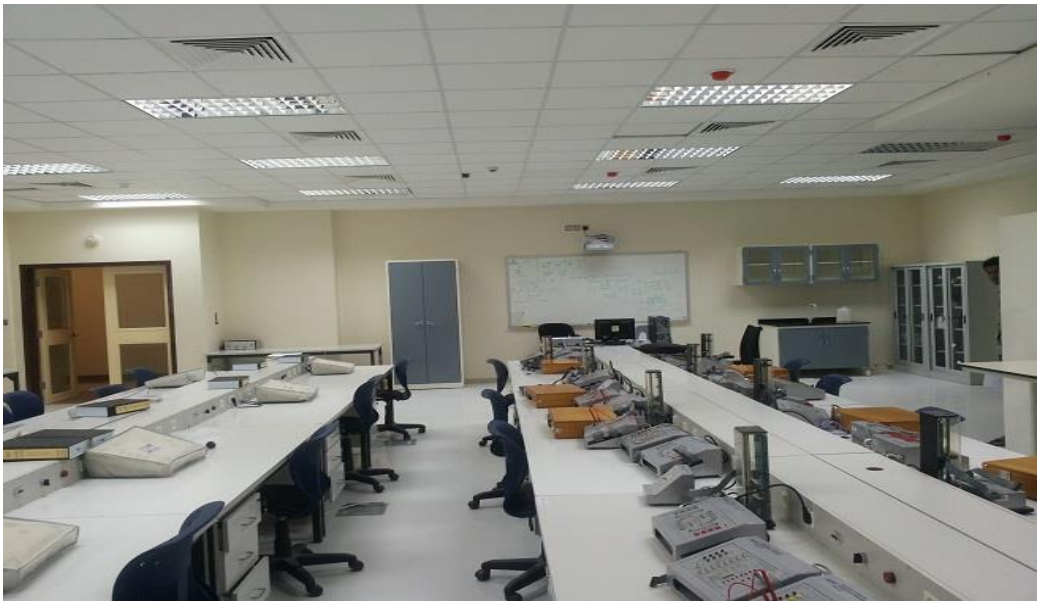

Figure 14(b) A partial view of the Microprocessor laboratory

Lab view and Renewable Energy Laboratory

In this lab, the students and teacher perform their research work on renewable energy using lab view.

Figure 15 A partial view of Labview and Renewable Energy Laboratory

Computer Laboratory

In this lab, the students perform programming on C and C++ languages, MATLAB, Simulink and Labview to compete with the latest technology.

Figure 16 A partial view of Computer Laboratory

DEPARTMENT COMMITTEES & UNITS

The department has several committees and units each of which is composed of a convener and at least two faculty members to assist in managing academic and administrative affairs of the department.

1. Accreditation and Assessment Committee (AAC)
2. Academic Program and Learning Resources
3. Labs, Safety & Equipment committee
4. Students Affairs Committee
5. Research & Community Service Committee
6. Registrar and Exams committee
7. Graduates and Human Resources Committee

Industrial Advisory Council (IAC)

Figure 17 Industrial Advisory Council

List of Members of Industrial Advisory Council

S.No.	Name of Members	Organization
1	Dr. Saleh S. Almasabi	EE at NU
2	Dr. Turki M. Alsuwian	EE at NU
3	Dr. Yaqub A. Mahnash	KFUPM
4	Eng. Yousef S. Alsheref	Saudi Electric Company
5	Eng. Ahmed S. Alqarni	Saudi Electric Company
6	Eng. Bader I. Altwjri	STC
7	Eng. Fawaz M. Badqaish	Saline Water Conversion Corporation
8	Eng. Ali Al-Aqila	Project Management at NU
9	Eng. Alhassan M. Al-Mutair	Saudi Electric Company

10	Eng. Alhassan M. Alzemanan	Saudi Electric Company

Objective of Industrial Advisory Council (IAC)

The Industrial Advisory Council (IAC) aims at contributing to the continuous improvement of the College's academic programs, guiding its future policies, evaluating its operational plans and communicating with the public and private sectors.

General Organization of Industrial Advisory Council (IAC)

The Industrial Advisory Council shall nominate the members of the Council not less than nine members and not more than fifteen members. The composition of the Council shall be as follows:

- Chairman of the program.
- Vice Dean for Student Affairs.
- Members (seven to thirteen) with experience in various business sectors from inside or outside the Kingdom, including some distinguished graduates.

- The Board shall meet, at the invitation of its President, at least twice a year.
- The sessions of the Council may be held inside or outside the college and it may invite any person outside of the Council Committee to attend its meetings.
- Membership of the Council shall be for two years, subject to be renewable, as required.
- The certificate of appreciation shall be given to the Members of the Board at the end of their tenure from the Advisory Council.

Functions of the Industrial Advisory Council

Industrial Advisory Council is purely advisory. It is not an administrative, legal or policy making body. Its support for the college and its students involves certain roles and/or responsibilities. The main functions of CAC members are:

- Making proposals on what serves the future of the college.
- Provide ways to deepen partnership between the college and the local and global community.
- Contribute to the development of programs and curricula according to the requirements of the labor market.
- Contribute to the implementation of the operational plan of the College.
- Provide proposals that should provide material and moral support to the College.

- Contribute to the establishment of a coordination mechanism to establish joint projects between the college and the sectors of society in order to find solutions to the problems of society in an integrated manner.
- To propose methods to provide funding sources for the College's development projects.
- Identifying jobs or entrepreneurial opportunities, through co-op work experiences, internships, apprenticeships, topical summits, or career fair involvement.

To check the current and future trends affecting the program and then recommending the knowledge, skills and competencies required for successful career entry or re-entry in KSA.

ADMISSION REQUIREMENTS & REGULATIONS FOR THE BACHELOR PROGRAMS

Admission Requirements of the College of Engineering

Students who are admitted to Electrical Engineering program in Najran University should satisfy the general and special requirements as follow-

General Requirement

The general requirements are enlisted as follow-

1. The student shall only be admitted to the university upon the calculation of his average on 30% in general aptitude, 30% in achievement test and 40% in general secondary education, if the students wishes to enrol in preparatory year. For all the other specializations, the average shall be calculated as follows: 30% aptitude and 70% general secondary.
2. The student should obtain the general secondary certificate or its equivalent from the kingdom or abroad.
3. Not more than two academic years should have elapsed from the date of his obtaining such certificate or its equivalent.
4. The student should have a good conduct and proper behaviour.
5. The student should successfully pass exam or personal interview (when conducted).
6. The student should be medically fit.
7. The student should obtain approval from his authority to pursue his studies if he works for any governmental or private body.
8. The students should not have been expelled from Najran University or any other university for academic or disciplinary reasons.
9. After the students is admitted, if it turns out that he has already been expelled for disciplinary or academic reasons, his admission shall be considered as void.

10. Student fulfilling all the requirements should present the stipulated documents to the deanship of admission and registration of the university.

11. The enrolled student cannot be enrolled for another degree at the same university or at any other university and should not have already obtained such degree.

12. The files of student shall be ruled out if it is found that he is late for admission tests.

13. The files of student shall be ruled out if it is found that he is late for personal interviews and unable to present a genuine reason.

14. Student who are late in carrying out the admission procedures within the deadline set by the university and do not present an acceptable excuse to the Deanship of Admission and Registration shall not be admitted.

The admission procedures are regulated by the "Education and Examination Regulations" available at URL https://dadr.nu.edu.sa/en/94

Transfer of Students and Transfer Courses

Transfer of students to electrical engineering program at Najran University can be done through three different channels as follows:

Transfer from Other Universities

General Requirements: With the consent of the administrator in charge, students may transfer from other universities in conformity with the rules adopted by the student affairs committee and according to the following general guidelines:

- The student must be enrolled at an accredited college or university.
- The student must not have been dismissed from that university for educational or disciplinary reasons.
- The student must meet the requirements of admission transfer.
- The transferred students are required to complete more than 60% of the total required credit hours in Najran University. The college council is responsible for equating the courses studied at other universities to the equivalent courses of the department and accordingly a recommendation is forwarded to the department council. The equated courses are then credited and applied to the student's academic record, but not be applied to the cumulative GPA.
- The transfer procedure should be completed within the period specified by the Dean of Admission and Registration, provided that the period does not exceed end of the second week from the beginning of the academic semester. After the fulfilment of all requirements, the student receives a transfer notice allowing him to attend courses after the issuance of a university ID.
- The enrolment is considered void in the case of coming out that the student had been previously dismissed from a university due to disciplinary or educational reasons.

These requirements and process for accepting transfer students are governed by the Article #15.1 of the Policy on Regulations of Study and Examinations.

Additional Requirement: In addition to the above mentioned general requirements, few more requirements are set by the council of electrical engineering program. These requirements may be changed each year by the approval of program council. Currently these requirements are:

- Assure the students finish successfully the Preparatory Year Program or equivalents.
- Verify the condition of specialization in Najran University.
- Transfer from the similar engineering program.
- The balancing grade used 90% of the student's GPA at the preparatory Year (PY) and 10 % based on the standardized test for Math (Tahsili).

Internal Transfer from Other Colleges within the University

General Requirements: With the consent of the administrator in charge, students may transfer from one college to another within the university in conformity with the regulations adopted by the Student Affairs Committee, and according to the following guidelines:

- The Student's grade point average (GPA) should not be less than 2.0.
- The Student must not have been previously transferred during his study at the university.
- The academic period remaining must be sufficient for the completion of the graduation requirements.
- The student should apply to the dean of admission and registration about his transfer from one college to another by completing the appropriate form. Upon completion of the transfer procedures, the student will receive a notification allowing him to study at the college in which they are transferred.
- All the transfer procedures are completed within the period determined by the office of dean of admission and registration, provided that the period does not exceed the first week after beginning of an academic semester.
- All the completed courses that are transferred from one college to another are academically recorded including semester grades, and grade point average (GPA) throughout his study in the university.

Additional Requirements: Few additional requirements are set by the council of electrical engineering program beside the above mentioned general requirements. These requirements could be changed each year with the approval of program council. These requirements are:

- Students can apply for transfer only after studying at least one semester in the college they are registered. (Summer semester is not counted).
- Transfer from any non-science college to any college of engineering is not allowed.
- Transfer from any college that does not require preparatory year, is not allowed.

The minimum GPA for transferring from other colleges of the University to electrical engineering program is illustrated in Table below.

Table 7 The condition for transfer of student within the University

From	To	Minimum CGPA	Number of students
College of Medicine	Electrical Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council
College of Dentistry	Electrical Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council
Applied Medical Sciences	Electrical Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council
College of Computer Science and Information Systems	Electrical Engineering Program College of Engineering	4	According to the capacity of the department which is decided each year by the department council

Transfer from Any Other Program to Electrical Engineering within the College of Engineering

General Requirements: With the consent of the administrator in charge, students may transfer from any other program of the college to electrical engineering within the university in conformity with the regulations adopted by the student affairs committee, and according to the following guidelines:

- The student must have spent at least one semester in their major.

- The student is not entitled to be transferred within the same college from one major to another for more than twice during their tenure in the university.
- The academic period remaining must be sufficient for completion the graduation requirements.
- All the studied courses that are transferred from one major to another are mentioned in their academic record, including any awards, semester grades, and grade point averages GPA throughout their tenure in the university.

Additional Requirements:

The minimum GPA for transferring student within the University to electrical engineering program is illustrated in table below.

Table 8 Transfer to Electrical Engineering Program from any other program of the College of Engineering

From	To	Minimum CGPA	Max number of students allowing to transfer per semester
Department of Civil Engineering	Department of Electrical Engineering	4	According to the capacity of the department which is decided each year by the department council
Department of Architecture Engineering	Department of Electrical Engineering	4	According to the capacity of the department which is decided each year by the department council

Visiting Student of Electrical Engineering to Other Universities

A student from the program (EE) is entitled to complete some courses in another university upon the fulfillment of the following conditions:

- The student should be regular in their academic record and apply using a prescribed form available on the website:
- The college should receive the application at least two semesters earlier from their enrolment as a visitor student.
- The student must receive a prior consent from their academic institution permitting him to study as a visitor student along with the courses to be studied.

- The college is responsible to stipulate the equivalence of courses between two programs. The student would be given official letter from the Dean of Admission and Registration Affairs enabling them to begin registration.
- The studied courses must be completed at an accredited college or university.
- The courses, studied by the student outside the university, are made equivalent by considering all of its contents and the assigned credit hours must not be less than any courses included in the graduation requirements.
- The maximum number of credit hours that can be counted from other university should be less than 20% of the total credit hours required to graduate at Najran University.
- The equivalent courses for the visiting student are not considered in calculating their cumulative GPA.
- The student must provide the obtained grades to the office of Dean of Admission and Registration within two weeks of the beginning of the academic semester. If the student fails to submit their grades, they are considered as non-attending.

Visiting Student from Other Universities to Electrical Engineering Department

The student from another university is entitled to study in Najran University as a visiting student under the following conditions-

- The student should have an academic record of at least two semesters from their current university.
- The student must not have been dismissed due to disciplinary or educational reasons.
- The student must obtain a prior written consent and enlisted courses to be studied from the deanship of admission and registration of his current university in order to study as a visitor in Najran University.
- The maximum limit of academic semesters that the student is allowed to study as a visitor is 2 semesters.
- The courses the student wishes to study should be registered in accordance with the registration requirements.
- The visiting student does not receive any grants by Najran University.
- By the end of his study, the student is provided with the results obtained in the courses studied by a transcript demonstrating the attained grades.

Transfer Credit

Courses, taken by the students outside the Najran University, may be transferred upon the approval from the college council. Electrical engineering department or the concern department recommends on the approval of the equivalent courses along with its corresponding credit hours. The transferred equivalent courses are recorded in the student's academic profile. The equivalent credit hours are approved for only those courses in which the students has obtained a letter grade

of ‘C’ or above. But the points of the equivalent courses are not used in the computation of CGPA of the student.

The transferred student submit an application asking for equivalent credits to the chairman of electrical engineering department along with the original academic record and certified detailed description of the courses taken outside Najran University. The chairman of electrical engineering department refers the application to the concerned academic advisor and curriculum committee for evaluation of equivalent credit. This evaluation is performed on a case-by-case basis. This evaluation is considered according to the following circumstances:

a) The credit hour of the course is equal or more than that of the equivalent course in Najran University.
b) The grade of the course obtained is 'C' or above.
c) The content of the course matches at least 80% of the same in Najran University.

After the department approves the credit transfer, the department applies for getting approval of the college council using the equivalency evaluations. After college council approves the application, it is sent to the deanship of admission and registration. The requirements and process for courses equivalency and credit transfer are governed by Article #43 of the Policy on Regulations of Study and Examinations.

Out of the six engineering sections mentioned in Figure 1 (a), Organizational Chart for the College of Engineering, only three are running presently and the rest three i.e. Mechanical Engineering, Chemical Engineering and Industrial Engineering Department are under the progress to get start from the next session. The lab and syllabus curriculum are ready for these three departments and is pending for the approval at the university level.