

CRITERION 5. CURRICULUM

A. Program Curriculum

A.1. Description of the study plan for students in the program

The Electrical Engineering Department has maintained a strong commitment to provide high quality programs by conscientiously evaluating priorities and efficiencies of educational functions. Continuous revisions in curriculum have been updated based on the requirements of industries with respect to the recent technological developments. The revisions and modifications with reference to the standards of International Universities provided an opportunity to self-evaluate effectiveness of educational procedures and practices. The redesigned program consists of sequential and progressive courses. These courses provide the students with the fundamental knowledge of mathematical and scientific subjects with the basics of Electrical Engineering. The curriculum consists of a broad range of subjects that form the foundation of the electrical engineering discipline including the importance of engineering design.

The Electrical Engineering curriculum and course offerings are shown in Table 5.1 (per the template provided in the ABET self-study).

The study plan for the Electrical Engineering Department is designed to satisfy three main requirements. The first is the university requirement which includes the Islamic cultural and social courses. The second is the college requirement which involves the basic science courses and other courses related to the electrical engineering field. The third is the department requirement which includes the advanced courses in the electrical engineering field with different sub disciplines.

The Electrical Engineering Program consists of 160 total credit hours:

- University Requirements: 15 credit hours.
- Faculty Requirements: 63 credit hours.
- Department Requirements: 82 credit hours.

Table 5-1 Curriculum

Bachelor in Electrical Engineering

Course (Department, Number, Title) List all courses in the program by term starting with the first term of the first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE. ¹	Subject Area (Credit Hours)			Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Maximum Section Enrollment for the Last Two Terms the Course was Offered ²
		Math & Basic Sciences	Engineering Topics Check if Contains Significant Design (√)	Other		
Level 1						
101SLM-2: Islamic Culture I	R			2	2021-1&2	125 - 63
101ENG-6: English 1	R			6	2021-1&2	30 - 35
101MATH-3: General Mathematics	R	3			2021-1&2	32 - 27
101CSC-3: Introduction to Computer	R			3	2021-1&2	65 - 25
Level 2						
102SLM-2: Islamic Culture II	R			2	2021-1&2	165 - 107
102ENG-6: English 2	R			6	2021-1&2	32 - 30
211MATH-3: Calculus 1	R	3			2021-1&2	33 - 41
101PHYS-4: General Physics	R	4			2021-1&2	31 - 33
Level 3						
101ARB-2: Arabic Language Skills	R			2	2021-1&2	167- 124
CHEM106-4: General Chemistry	R	4			2021-1&2	32 - 36
MATH228-3: Calculus 2	R	3			2021-1&2	36 - 34
PHYS203-3: Physics 2	R	3			2021-1&2	36 - 30
ME131-2: Engineering Drawing	R		2		2021-1&2	23 - 30
EE111-3: Fundamentals of Electrical Engineering	R		3		2021-1&2	38 - 30

Level 4						
103SLM-2: Islamic culture III	R			2	2021-1&2	125 - 131
CHEM206-3: Chemistry 2	R	3			2021-1&2	35 - 40
MATH319-3: Calculus 3	R	3			2021-1&2	44 - 41
EngM118-3: Thermal Engineering	R		3		2021-1&2	34 - 30
ME132-3: Engineering Design	R		3 (√)		2021-1&2	34 - 35
EngM137-2: Engineering Mechanics	R		2		2021-1&2	32 - 40
EE112-2: Electrical Circuits 1	R		2		2021-1&2	24 - 30
Level 5						
102ARB-2: Arabic Writing	R			2	2021-1&2	160 - 128
MATH336-3: Differential Equations	R	3			2021-1&2	39 - 37
CSC222-3: Programming Language	R			3	2021-1&2	43 - 41
EE213-2: Electrical Circuits 2	R		2		2021-1&2	54 - 30
EE214-2: Electromagnetic Field	R		2		2021-1&2	48 - 39
EE221-2: Electrical Safety	R		2(√)		2021-1&2	67 - 38
EE271-3: Electronics	R		3		2021-1&2	48 - 36
Level 6						
104SLM-2: Islamic culture IV	R			2	2021-1&2	122 - 118
STAT354-3: Statistics and Probability	R	3			2021-1&2	42 - 38
IE346-2: Engineering Economy	R		2		2021-1&2	38 - 35
EE215-3: Measurements	R		3		2021-1&2	43 - 49
EE216-2: Electrical Installations	R		2 (√)		2021-1&2	34 - 36
EE251-3: Electrical Machines 1	R		3		2021-1&2	30 - 31
EE272-2: Digital Design	R		2 (√)		2021-1&2	50 - 31
Level 7						
ENG357-3: Technical Writing	R			3	2021-1&2	41 - 34
EE322-3: Power Production and Distribution	R		3		2021-1&2	44 - 44
EE341-3: Automatic control	R		3		2021-1&2	16 - 31
EE342-2: Microprocessor	R		2		2021-1&2	43 - 50
EE352-3: Electrical Machines 2	R		3		2021-1&2	57 - 43
EE373-2: Practical Special Topic	R		2		2021-1&2	40 - 43
EE374-2: Signal Processing	R		2		2021-1&2	37 - 47

Level 8						
MATH410-3: Numerical Methods		R	3			2021-1&2 29 - 37
EE323-3: Power Systems 1		R		3		2021-1&2 10 - 37
EE343-2: Robotics		R		2 (√)		2021-1&2 22 - 29
EE353-3: Power Electronics		R		3		2021-1&2 34 - 37
EE354-3: Electrical Machines 3		R		3		2021-1&2 13 - 46
EE375-2: Communications		R		2		2021-1&2 23 - 34
EE496-2: Summer training		R		2		2021-3 45
Level 9						
EE424-3: Power Systems 2		R		3		2021-1&2 10 - 21
EE425-3: Switchgear and protection of power systems		R		3 (√)		2021-1&2 15 - 34
EE426-3: High voltage Engineering		R		3		2021-1&2 17 - 24
EE491-3: Elective Course 1		SE		3 (√)		2021-1&2 20 - 24
EE498-1: Senior Design Project 1		R		1 (√)		2021-1&2 34
Level 10						
EE427-2: Economic Operation of Power Systems		R		2		2021-1&2 27 - 36
EE428-2: Renewable Energies		R		2		2021-1&2 53 - 26
EE455-2: Simulation of Machines		R		2 (√)		2021-1&2 37 - 26
EE492-2: Elective Course 2		SE		2 (√)		2021-1&2 34 - 19
EE493-2: Elective Course 3		SE		2 (√)		2021-1&2 33 - 19
EE499-3: Senior Design Project 2		R		3 (√)		2021-1&2 34
TOTALS (in terms of semester credit hours)			35	92	33	
OVERALL TOTAL CREDIT HOURS FOR COMPLETION OF THE PROGRAM			160			
Total must satisfy minimum credit hours		Minimum Semester Credit Hours	30 Hours	45 Hours		

1. **Required** courses are required of all students in the program, **Elective** courses (often referred to as open or free electives) are optional for students, and **Selected Elective** courses are those for which students must take one or more courses from a specified group.
2. For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the maximum enrollment in each element. For Selected Elective courses, indicate the maximum enrollment for each option.

Instructional materials and student work verifying compliance with ABET criteria for the categories indicated above will be required during the campus visit

A.2. Alignment of the curriculum with the program educational objectives.

The mapping of the Student Outcomes to Program Educational Objectives is shown in Table 5.1.

Table 5.1: Relationship between Program Educational Objectives and Student Outcomes

	Program Educational Objectives	Specific Skills	Student Outcomes
PEO1	Become a technically qualified engineer to address complex problems and be able to apply learned skills in engineering careers	identify, formulate, and solve complex engineering problems	SO1
		apply engineering design	SO2
		develop and conduct appropriate experimentation	SO6
		acquire and apply new knowledge	SO7
PEO2	Become effective members of engineering teams through interpersonal skills gained by conducting experiments and during practical training	communicate effectively	SO3
		function effectively on a team	SO5
		develop and conduct appropriate experimentation	SO6
PEO3	Demonstrate the professional skills necessary to be competent employees, assume leadership roles, and have career success and satisfaction	apply engineering design	SO2
		communicate effectively	SO3
		function effectively on a team	SO5
PEO4	Demonstrate ethical values, life-long learning attitude and societal responsibilities	recognize ethical and professional responsibilities	SO4
		acquire and apply new knowledge	SO7

A.3. The support of the curriculum and its associated prerequisite structure to the attainment of the student outcomes.

An assessment tool is used each semester for each course to measure the level of achievement of each Course Learning Outcomes which is linked to the Student Outcomes via Performance Indicators and this tool is reviewed by the Assessment Committee and Curriculum Committee. The result from this review assures the quality of departmental courses and becomes part of the continuous improvement.

Student outcomes are involved by most of the core courses, the degree of involvement is presented in the Table 5.2.

A.4. Flowchart of the prerequisite structure of the program's required courses.

A flowchart showing the prerequisite requirements for the required Electrical Engineering courses is shown in Figure 5.1 and Tables 5.3 to 5.12.

Table 5.2: Involvement of Student Outcomes in core courses

Course Code	Course Name	SO1	SO2	SO3	SO4	SO5	SO6	SO7
EE111-3	Fundamentals of Electrical Engineering	I		I	I	I	I	I
EE112-2	Electrical Circuits 1	I		I	I	I	I	I
EE213-2	Electrical Circuits 2	E		E	R	E	E	R
EE214-2	Electromagnetic Field	E	I	E	R	E	E	R
EE221-2	Electrical Safety	E	E	E	E	E	E	E
EE271-3	Electronics	E		E	E	E	E	E
EE215-3	Measurements	E		E	I	E	E	I
EE216-2	Electrical Installations	R	E	E	E	E	E	R
EE251-3	Electrical Machines 1	R		R	I	R	R	I
EE272-2	Digital Design	E	E	E	R	E	E	I
EE322-3	Power Production and Distribution	E		E	E	E	E	I
EE341-3	Automatic control	E		E	R	E	E	I
EE342-2	Microprocessor	I		E	I	E	E	I
EE352-3	Electrical Machines 2	E		E	R	E	E	R
EE373-2	Practical Special Topic	R		E	I	E	E	I
EE374-2	Signal Processing	E		E	E	E	E	E
EE323-3	Power Systems 1	R		R	R	R	R	
EE343-2	Robotics	R	R	E	R	E	E	
EE353-3	Power Electronics	E		E	R	E	E	I
EE354-3	Electrical Machines 3	E	I	E	R	E	E	R
EE375-2	Communications	R		E	E	E	E	R
EE424-3	Power Systems 2	E		E	E	E	E	R
EE425-3	Switchgear and protection of power systems	E	E	E	E	E	E	R
EE426-3	High voltage Engineering	E		E	E	E	E	E
EE427-2	Economic Operation of Power Systems	E				R		R
EE428-2	Renewable Energies	E		E	E	E	E	E
EE455-2	Simulation of Machines	R	E	E	R	E	E	R
EE429-3	Utilization of Electrical Power (Elective 1)	E		E	R	E	E	R
EE444-3	Advanced Automatic Control (Elective 1)	E	E	E	R	E	E	R
EE456-3	Advanced Electrical Machines (Elective 1)	E	E	E	R	E	E	R
EE431-2	High voltage applications (Elective 2)	E		E	E	E	E	R
EE432-2	Protection of power Systems (Elective 2)	E	E	E	E	E	E	R
EE445-2	Special Topic in Control (Elective 2)	E	R	E	R	E	E	R
EE446-2	Control of Power Electronics (Elective 2)	E	R	E	R	E	E	R
EE457-2	Electrical Drives Systems (Elective 2)	E	R	E	R	E	E	R
EE458-2	Design of Power Electronics (Elective 2)	E	E	E	R	E	E	R
EE433-2	Organization of Power Systems (Elective 3)	E		E	R	E	E	R
EE434-2	Advanced Power Systems (Elective 3)	E		E	E	E	E	R
EE447-2	Computer Control (Elective 3)	E		E	R	E	E	R
EE448-2	Components of Control (Elective 3)	E		E	R	E	E	R
EE459-2	Application of Power Electronics (Elective 3)	E		E	R	E	E	R
EE461-2	Electrical Machine Design (Elective 3)	E	E	E	R	E	E	R
EE496-2	Summer training			R	R	R	R	R
EE498-1	Senior Design Project 1	E	E	E	E	E	E	E
EE499-3	Senior Design Project 2	E	E	E	E	E	E	E

(I): Introduced - (R): Reinforced - (E): Emphasized

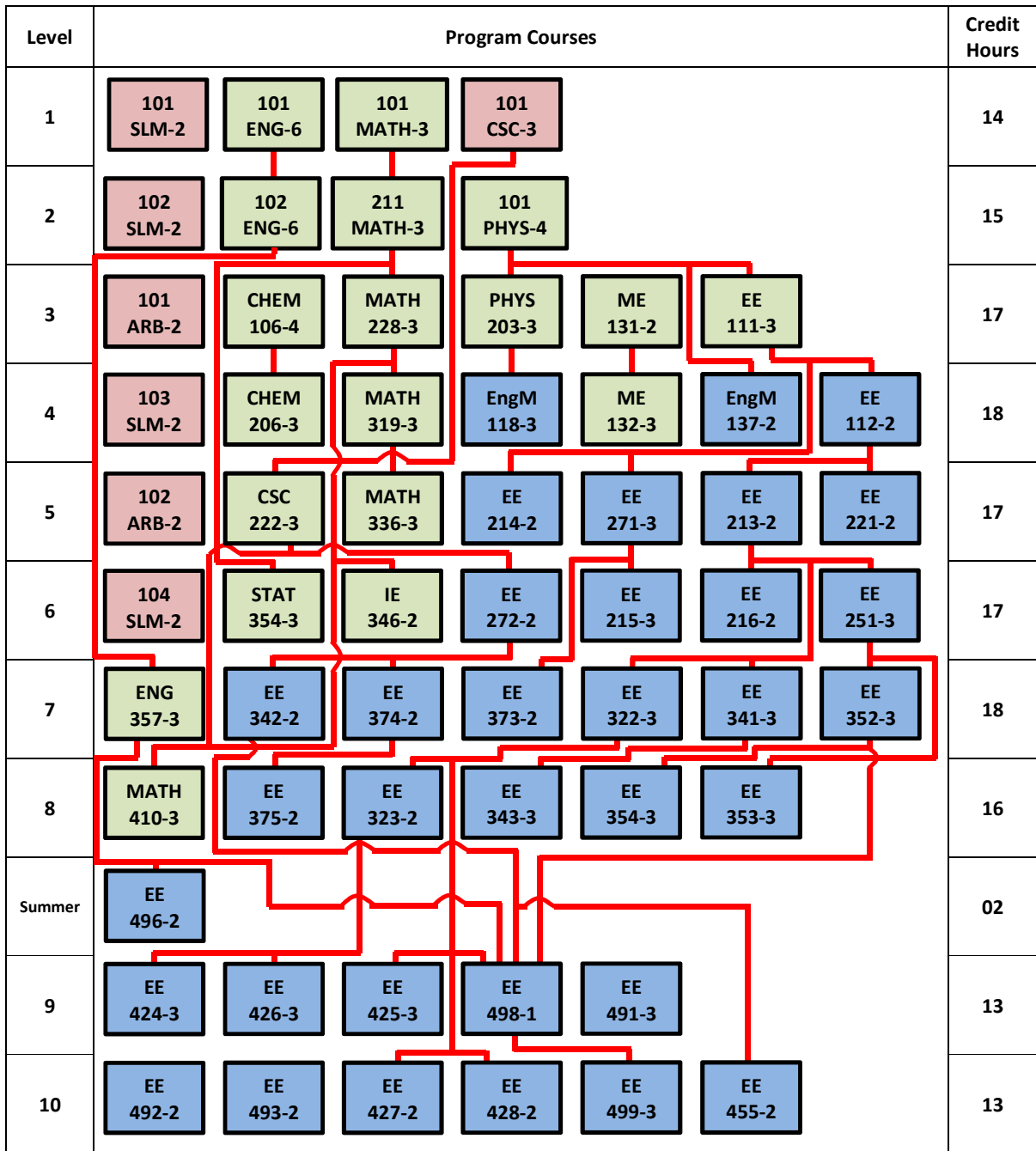


Figure 5.1: Flow chart for the Electrical Engineering Program

Table 5.3: Program structure for 1st year – level 1

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
101SLM-2	Islamic Culture I	2	2	-	-	-
101ENG-6	English 1	6	12	6	-	-
101MATH-3	General Mathematics	3	3	-	-	-
101CSC-3	Introduction to Computer	3	2	2	-	-
Total		14	19	08	-	27

Table 5.4: Program structure for 1st year – level 2

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
102SLM-2	Islamic Culture II	2	2	-	-	-
102ENG-6	English 2	6	12	6	-	101ENG-6
211MATH-3	Calculus 1	3	3	-	-	101MATH-3
101PHYS-4	General Physics	4	3	2	-	-
Total		15	20	08	-	28

Table 5.5: Program structure for 2nd year – level 3

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
101ARB-2	Arabic Language Skills	2	2	-	-	-
CHEM106-4	General Chemistry	4	3	2	-	-
MATH228-3	Calculus 2	3	3	-	-	211MATH-3
PHYS203-3	Physics 2	3	2	2	1	101PHYS-4
ME131-2	Engineering Drawing	2	-	5	-	-
EE111-3	Fundamentals of Electrical Engineering	3	2	2	1	101PHYS-4
Total		17	12	11	02	25

Table 5.6: Program structure for 2nd year – level 4

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
103SLM-2	Islamic culture III	2	2	-	-	-
CHEM206-3	Chemistry 2	3	2	-	2	CHEM106-4
MATH319-3	Calculus 3	3	3	-	-	MATH228-3
EngM118-3	Thermal Engineering	3	3	-	1	PHYS203-3
ME132-3	Engineering Design	3	2	2	-	ME131-2
EngM137-2	Engineering Mechanics	2	2	-	1	101PHYS-4
EE112-2	Electrical Circuits 1	2	1	2	1	EE111-3
Total		18	15	04	05	24

Table 5.7: Program structure for 3rd year – level 5

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
102ARB-2	Arabic Writing	2	2	-	-	-
MATH336-3	Differential Equations	3	3	-	-	MATH319-3
CSC222-3	Programming Language	3	2	2		101CSC-3
EE213-2	Electrical Circuits 2	2	1	2	1	EE112-2
EE214-2	Electromagnetic Field	2	1	2	1	EE111-3
EE221-2	Electrical Safety	2	1	2	1	EE112-2
EE271-3	Electronics	3	2	2	1	EE111-3
Total		17	12	10	04	26

Table 5.8: Program structure for 3rd year – level 6

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
104SLM-2	Islamic culture IV	2	2	-	-	-
STAT354-3	Statistics and Probability	3	3	-	-	211MATH-3
IE346-2	Engineering Economy	2	2	-	-	MATH228-3
EE215-3	Measurements	3	2	2	1	EE271-3
EE216-2	Electrical Installations	2	1	2	1	EE213-2
EE251-3	Electrical Machines 1	3	2	2	1	EE213-2
EE272-2	Digital Design	2	1	2	1	CSC222-3
Total		17	13	08	04	25

Table 5.9: Program structure for 4th year – level 7

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
ENG357-3	Technical Writing	3	3	-	-	102ENG-6
EE322-3	Power Production and Distribution	3	2	2	1	EE213-2
EE341-3	Automatic control	3	2	2	1	EE213-2
EE342-2	Microprocessor	2	1	2	1	EE272-2
EE352-3	Electrical Machines 2	3	2	2	1	EE251-3
EE373-2	Practical Special Topic	2	-	6	-	EE272-2
EE374-2	Signal Processing	2	1	2	1	EE272-2
Total		18	11	16	05	32

Table 5.10: Program structure for 4th year – level 8

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
MATH410-3	Numerical Methods	3	3	-	-	MATH228-3 CSC222-3
EE323-3	Power Systems 1	3	2	2	1	EE322-3
EE343-2	Robotics	2	1	2	1	EE341-3
EE353-3	Power Electronics	3	2	2	1	EE251-3
EE354-3	Electrical Machines 3	3	2	2	1	EE352-3
EE375-2	Communications	2	1	2	1	EE374-2
EE496-2	Summer training	2	-	-	-	ENG357-3
Total		18	11	10	05	26

Table 5.11: Program structure for 5th year – level 9

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
EE424-3	Power Systems 2	3	2	2	1	EE323-3
EE425-3	Switchgear and protection of power systems	3	2	2	1	EE322-3
EE426-3	High voltage Engineering	3	2	2	1	EE323-3
EE491-3	Elective Course 1	3	2	2	1	According to each course
EE498-1	Senior Design Project 1	1	-	3	-	ENG357-3 EE322-3 EE342-2 EE352-3
Total		13	08	11	04	23

Table 5.12: Program structure for 5th year – level 10

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
EE427-2	Economic Operation of Power Systems	2	2	-	-	EE322-3
EE428-2	Renewable Energies	2	1	2	1	EE322-3
EE455-2	Simulation of Machines	2	1	3	-	EE342-2
EE492-2	Elective Course 2	2	1	2	1	According to each course
EE493-2	Elective Course 3	2	1	2	1	According to each course
EE499-3	Senior Design Project 2	3	-	7	-	EE498-1
Total		13	06	16	03	25

A.5. Program requirements in terms of hours and depth of study for each subject area (Math and Basic Sciences, Engineering Topics)

Mathematics and Basic Sciences content:

The Math requirements are covered by courses required for graduation. This includes “General Mathematics”, “Calculus 1”, “Calculus 2”, “Calculus 3”, “Differential Equations”, “Numerical Methods” and “Statistics and Probability”. (21 credit units).

Chemistry and Physics are foundational material to the basic engineering science courses. Basic Sciences requirements are met by two courses in Chemistry with Lab (7 credit units) and two courses in Physics with Lab (7 credit units). Mathematics and Basic Sciences courses are summarized in Table 5.13.

Table 5.13: Mathematics and Basic Sciences courses

No.	Course Code	Course Title	Credit Units	Contact Hours
1	101MATH-3	General Mathematics	3	3
2	211MATH-3	Calculus 1	3	3
3	MATH228-3	Calculus 2	3	3
4	MATH319-3	Calculus 3	3	3
5	MATH336-3	Differential Equations	3	3
6	MATH410-3	Numerical Methods	3	3
7	STAT354-3	Statistics and Probability	3	3
8	CHEM106-4	General Chemistry	4	5
9	CHEM206-3	Chemistry 2	3	4
10	101PHYS-4	General Physics	4	5
11	PHYS203-3	Physics 2	3	5
Total		11 Courses	35	40

Engineering Topics:

The technical core prepares students not only for basic Electrical Engineering fields but also equip them with other much needed backgrounds by offering to them the courses like “Engineering drawing” course (2 credit units), “Engineering Design” course (3 credit units), “Engineering economy” course (2 credit units), “Thermal Engineering” course (3 credit units) and “Engineering Mechanics” course (2 credit units). These courses are taught by Mechanical Engineering and Industrial Engineering Departments in our Faculty of Engineering.

The technical core which includes the advanced courses in the electrical engineering filed is formed by 7 disciplines presented in Table 5.14

Table 5.14: Electrical Engineering Requirements Based on Disciplines

Discipline	Course Code	Course Title	Credit Units	Contact Hours
Electrical Engineering	EE111-3	Fundamentals of Electrical Engineering	3	5
	EE112-2	Electrical Circuits 1	2	4
	EE213-2	Electrical Circuits 2	2	4
	EE214-2	Electromagnetic Field	2	4
	EE215-3	Measurements	3	5
	EE216-2	Electrical Installations	2	4
	6 Courses		14	26
Powers	EE221-2	Electrical Safety	2	4
	EE322-3	Power Production and Distribution	3	5
	EE323-3	Power Systems 1	3	5
	EE424-3	Power Systems 2	3	5
	EE425-3	Switchgear and protection of power systems	3	5
	EE426-3	High voltage engineering	3	5
	EE427-2	Economic Operation of Power Systems	2	2
	EE428-2	Renewable Energies	2	4
	8 Courses		21	35
Automatic Control	EE341-3	Automatic Control	3	5
	EE342-2	Microprocessor	2	4
	EE343-2	Robotics	2	4
	3 Courses		7	13
Machines	EE251-3	Electrical Machines 1	3	5
	EE352-3	Electrical Machines 2	3	5
	EE353-3	Power Electronics	3	5
	EE354-3	Electrical Machines 3	3	5
	EE455-2	Simulation of Machines	2	4
	5 Courses		14	24
Electronics and communications	EE271-3	Electronics	3	5
	EE272-2	Digital Design	2	4
	EE373-2	Practical Special Topic	2	6
	EE374-2	Signal Processing	2	4
	EE375-2	Communications	2	4
	5 Courses		11	23
Elective Courses	EE491-3	Elective Course 1	3	5
	EE492-2	Elective Course 2	2	4
	EE493-2	Elective Course 3	2	4
	3 Courses		7	13
Training & Project	EE496-2	Summer Training	2	-
	EE498-1	Senior Design Project 1	1	3
	EE499-3	Senior Design Project 2	3	7
	3 Courses		6	10

Elective Courses

The Electrical Engineering Program offered three groups of elective courses: Power Systems group, Automatic Control group and Machines group. The student must select three courses from the same group. Elective courses in each group are presented in Table 5.15.

Table 5.15: Elective courses of the Electrical Engineering Program

Course Code	Course Title	Credit Units	Contact Hours			Pre-requisite
			Lec.	Lab.	Tut.	
Power Systems Group						
EE491-3: Elective Course 1						
EE429-3	Utilization of Electrical Power	3	2	2	1	EE323-3
EngE492-2: Elective Course 2						
EE431-2	High voltage applications	2	1	2	1	EE426-3 EE429-3
EE432-2	Protection of power Systems	2	1	2	1	EE424-3 EE429-3
EE493-2: Elective Course 3						
EE433-2	Organization of Power Systems	2	1	2	1	EE429-3
EE434-2	Advanced Power Systems	2	1	2	1	EE429-3
Automatic Control Group						
EE491-3: Elective Course 1						
EE444-3	Advanced Automatic Control	3	2	2	1	EE341-3
EE492-2: Elective Course 2						
EE445-2	Special Topic in Control	2	1	2	1	EE444-3
EE446-2	Control of Power Electronics	2	1	2	1	EE444-3 EE353-3
EE493-2: Elective Course 3						
EE447-2	Computer Control	2	1	2	1	EE444-3
EE448-2	Components of Control	2	1	2	1	EE444-3
Machines Group						
EE491-3: Elective Course 1						
EE456-3	Advanced Electrical Machines	3	2	2	1	EE354-3
EE492-2: Elective Course 2						
EE457-2	Electrical Drives Systems	2	1	2	1	EE456-3
EE458-2	Design of Power Electronics	2	1	2	1	EE456-3 EE353-3
EE493-2: Elective Course 3						
EE459-2	Application of Power Electronics	2	1	2	1	EE456-3 EE353-3
EE461-2	Electrical Machine Design	2	1	2	1	EE456-3

Summer Training

An important component of the curriculum is eight-week mandatory summer training. This provision allows the students to acquire hands-on professional experience pertinent to their choice of selection of available training opportunities which usually cover a variety of applications in Electrical Engineering field. During this summer training, the students gain valuable practical training in real competitive environment which not only provide them with an insight to the modern environmental engineering practices followed today but also give them an opportunity to interact, collaborate and work together with highly experienced professionals, which help students in their future professional growth.

A.6. The broad education component.

The University requirements component provides students with a breadth of knowledge that enables them to work collaboratively with others and have an appreciation for other disciplines. These requirements courses help the students become socially responsible leaders, respect other cultures and religions and to be capable of making humane and responsible decisions. It enhances their understanding of the culturally diverse nature of the local and national society through using “Islamic Culture I”, “Islamic Culture II”, “Islamic Culture III”, and “Islamic Culture IV” courses. The students’ linguistic skills in English are enhanced by courses such as “English 1”, and “English 2”. The written and oral skills of the students are improved with the help of “Technical Writing”, “Arabic Language Skills” and “Arabic Writing” courses. The students’ general computer skills are enhanced by course such as “Introduction to Computer” and “Programming Language” courses. The relationship of the general courses and PEOs are outlined in Table 5.16.

Table 5.16: General courses

General courses	PEO 1	PEO 2	PEO 3	PEO 4
101SLM-2: Islamic Culture I				<input type="checkbox"/>
102SLM-2: Islamic Culture II				<input type="checkbox"/>
103SLM-2: Islamic culture III				<input type="checkbox"/>
104SLM-2: Islamic culture IV				<input type="checkbox"/>
101ARB-2: Arabic Language Skills		<input type="checkbox"/>		
102ARB-2: Arabic Writing		<input type="checkbox"/>		
101ENG-6: English 1			<input type="checkbox"/>	
102ENG-6: English 2			<input type="checkbox"/>	
ENG357-3: Technical Writing			<input type="checkbox"/>	
101CSC-3: Introduction to Computer	<input type="checkbox"/>			
CSC222-3: Programming Language	<input type="checkbox"/>			

A.7. The design experience that prepares students for engineering practice.

Electrical Engineering Program has 11 courses out of 33 of the core courses, 34% of the core curriculum, that provide the students an ability to design a system, component, or process. These courses are: EE221-2: Electrical Safety, EE216-2: Electrical Installations, EE272-2: Digital Design, EE343-2: Robotics, EE425-3: Switchgear and protection of power systems, EE491-3: Elective Course 1, EE492-2: Elective Course 2, EE493-2: Elective Course 3, EE455-2: Simulation of Machines, EE498-1: Senior Design Project 1 and EE499-3: Senior Design Project 2.

Senior design project provides an integrated assessment of the students toward the desired electrical engineering competencies. The senior design project is the first step to transfer the students from the academic community to the industrial environment. The main target of the senior design project is to improve the students' technical skills, communication skills by integrating writing, presentation and teamwork opportunities. The senior design project is comprehensive and focuses on professional practice and includes a variety of non-technical issues such as professional and ethical responsibility, safety, reliability, and social impacts.

Senior design project is an independent study using a faculty advisor for guidance. The outcome of the student's work effort should be a coherent, logically organized senior project. As part of the senior project skills, the students will have the chance to demonstrate their capability to: manage the senior project, recognize the objectives, conduct the literature survey, perform the experiments and the relevant analysis, write the final senior project report, and deliver the main results. The project delivery might take the form of a report, simulation, prototype, or other type of specialized output.

Senior design project (EE498-1/ EE499-3) in the Electrical Engineering Department consists of two terms. Term one; students will have marks from 100 points. It is required a seminar for their project that contains a historical background, definitions, introduction, plan for next semester and the obtained results if any. Term two; students will have marks from 100 points. It's required a complete seminar for the whole projects, poster and project book with CD.

The objectives of Senior Design Project are:

- To use the skills acquired in the other courses to solve real engineering and technical problems.
- To enhance creativity of the students in analyzing and solving electrical engineering problems.
- Learn how to design and properly document a project based on technical requirements.
- To create an environment to promote cross disciplinary learning and team approach to problem solving.
- Communicate the project orally and in writing, using necessary supporting materials.
- To develop the ability of self-learning.
- To prepare students to be successful in their industrial careers.

By the end of the senior project, the student should be able to:

- Prepare a project concept document.
- Define the major problems that they may face during their practical work.
- Generate the possible solutions and select one alternative solution based on criteria.
- Acquire the necessary skills to communicate, negotiate, and evaluate their strengths and weaknesses as members of a team.
- Write a technical requirement document.
- Create and maintain a project schedule.
- Seek learning opportunities outside the classroom environment.
- Develop detailed design documents.
- Make oral presentations.
- Maintain a project schedule.
- Develop a test plan for a project.
- Build a system component.
- Test the operation of a system to prove it meets the requirements.

A.8. Cooperative education

The cooperative education was studied to be included in the Electrical Engineering Program but it has not yet been implemented.

A.9. Materials that will be available for review during the Visit

We will have the following material available for the program evaluator at the time of the scheduled visit.

- Course syllabi
- Textbooks
- Sample student work including quizzes, assignments, mid-term exams, final exams, course project reports, etc.
- Senior Design Project Reports and/or Posters

B. Course Syllabi

In Appendix A of the Self-Study Report, include a syllabus for each course used to satisfy the mathematics, science, and discipline-specific requirements required by Criterion 5.