

Department of Electronic Engineering, Main Campus

Proposed Curriculum for Session 2K18 onwards in accordance with PEC/HEC guidelines

Course #	Course Title	Lec.	Lab.	Pre-Req.
First Semester				
BH-111	Functional English	3	0	
BH-112	Calculus & Analytical Geometry	3	0	
BH-113	Applied Physics	3	1	
CS-114	Computer Fundamentals & Programming	2	1	
EN-115	Linear Circuit Analysis	3	1	
EN-116	Electronics Workshop	0	1	
		14	04	
	Total	18		
Second Semester				
BH-121	Communication Skills	3	0	
BH-122	Linear Algebra	3	0	Calculus & Analytical Geometry
CS-123	Computer-Aided Engineering Design	0	1	
CS-124	Object Oriented Programming	3	1	Computer Fundamentals & Programming
EN-125	Solid-State Electronics	2	0	
EN-126	Electronic Devices & Circuits	3	1	Linear Circuit Analysis, Applied Physics
		14	03	
	Total	17		
Third Semester				
BH-211	Differential Equations	3	0	Calculus & Analytical Geometry
EN-212	Electronic Circuit Design	3	1	Electronic Devices & Circuits
EN-213	Digital Logic Design	3	1	
EN-214	Electrical Network Analysis	3	1	Linear Circuit Analysis
EN-215	Instrumentation & Measurements	3	1	Linear Circuit Analysis
		15	04	
	Total	19		
Fourth Semester				
BH-221	Complex Variables & Transforms	3	0	Linear Algebra, Differential Equations
BH-222	Pakistan Studies	2	0	
EN-223	Microprocessors & Microcontrollers	3	1	Digital Logic Design
EN-224	Electrical Machines	3	1	Electrical Network Analysis
EN-225	Integrated Electronics	3	1	Electronic Circuit Design
		14	03	
	Total	17		
Fifth Semester				
BH-311	Social Sciences Elective I	3	0	
BH-312	Technical Report Writing & Presentation Skills	3	0	
EN-313	Probability & Random Variables	3	0	
EN-314	Electromagnetic Field Theory	3	0	Complex Variables & Transforms
BH-315	Signals & Systems	3	1	Electrical Network Analysis
		15	01	
	Total	16		
Sixth Semester				
BH-321	Islamic Studies	2	0	
BH-322	Social Sciences Elective II	3	0	
EN-323	Analog & Digital Communication	3	1	Electronic Circuit Design, Signals & Systems
EN-324	Control Systems	3	1	Electrical Network Analysis, Signals & Systems
EN-325	Digital Signal Processing	3	1	Signals & Systems
		14	03	
	Total	17		
Seventh Semester				
MS-411	Management Sciences Elective I	3	0	
EN-4XX	Elective-I	3	1	See list of Elective Courses
EN-4XX	Elective-II	3	0/1	See list of Elective Courses
XX-4XX	Elective-III	3	0/1	See list of Elective Courses
EN-499A	Electronic Engineering Project	0	3	
		12	4/6	
	Total	16/18		
Eighth Semester				
MS-421	Management Sciences Elective II	3	0	
EN-4XX	Elective-IV	3	1	See list of Elective Courses
EN-4xx	Elective-V	3	0/1	See list of Elective Courses
EN-499B	Electronic Engineering Project	0	3	
		09	4/5	
	Total	13/14		

List of Elective Courses				
Course #	Course Title	Lec.	Lab.	Pre-Req.
EN-412	FPGA-Based System Design	3	1	Digital Logic Design
EN-413	Embedded System Design	3	1	Introduction to Computers, Digital Logic Design
EN-414	Industrial Automation	3	1	Instrumentation & Measurements, Control Systems
EN/CS-415	Digital Image Processing	3	1	Digital Signal Processing
EN-416	VLSI Design	3	1	Integrated Electronics
EN-417	Digital System Design	3	1	Digital Logic Design
EN-418	Analog & Mixed Signal Design	3	1	Integrated Electronics
EN-419	RF Electronics	3	0	Analog and Digital Communications, Integrated Electronics
EN-420	Microelectronic Technology	3	0	Integrated Electronics
EN-422	Power Electronics	3	1	Electronic Circuit Design
EN-423	Computer Architecture	3	0	Microprocessors and Microcontrollers
EN/CS-424	Computer Communication Networks	3	1	Analog and Digital Communications
EN-425	Digital Control Systems	3	1	Control Systems
EN-426	Industrial Electronics	3	1	Power Electronics
EN/CS-427	Artificial Intelligence	3	1	Digital Logic Design
EN-428	Filter Design	3	1	Digital Signal Processing
EN-429	Introduction to Nanotechnology	3	0	Solid-State Electronics, Integrated Electronics
EN-430	Biomedical Instrumentation	3	1	Instrumentation & Measurements
EN-431	Opto-Electronics	3	0	Applied Physics
EN-432	Laser and Fiber Optics	3	0	Applied Physics
EN-433	Digital Instrumentation Systems	3	1	Instrumentation & Measurements
EN-434	Mobile Communications	3	0	Analog and Digital Communications
EN-435	Satellite Communications	3	0	Analog and Digital Communications
EN-436	Microwave Engineering	3	0	Electromagnetic Field Theory
EN-437	Wave Propagation and Antennas	3	1	Electromagnetic Field Theory, Electrical Network Analysis
EN-438	Navigational Aids	3	1	
EN-439	Operating System Concepts	3	0	Introduction to Computers
EN/CS-440	Advanced Object Oriented Programming	3	1	Computer Programming
EN/CS-441	Introduction to Neural Networks	3	1	Microprocessors and Microcontrollers, Artificial Intelligence
EN/CS-442	Fuzzy Logic and simulation	3	0	Microprocessors and Microcontrollers, Artificial Intelligence
EN/CS-443	Pattern Recognition and Matching	3	0	Digital Signal Processing
BH-444	Numerical Methods	3	0	
EN/MT-445	Introduction to Robotics	3	0	Linear Algebra
EN/MT-446	Mechatronics Applications	3	0	
EN/MT-447	Thermodynamics	3	0	
EN/MT-448	Mechanics of Materials	3	0	
EN/MT-449	Theory & Design of Machines	3	0	Mechanics of Materials
EN/MT-450	Engineering Dynamics	3	0	
EN/MT-451	Materials & Manufacturing Processes	3	0	

Note:

All the above mentioned Elective courses are either 3+0 credit hours or 3+1 credit hours. The Elective courses (either 3+0 or 3+1) offered by the department in a semester can be changed depending on the availability of teachers and related Lab facility and will be notified before the start of the semester.

List of Social Sciences Elective Courses	
Course Title	Pre-Req.
Professional and Social Ethics	Nil
Sociology and Development	Nil
Social Anthropology	Nil
Understanding Psychology and Human Behaviour	Nil
Applied Psychology	Nil
Organizational Behaviour	Nil
Introduction to Sociology	Nil
Critical Thinking	Nil
Introduction to Philosophy	Nil

List of Management Sciences Elective Courses	
Course Title	Pre-Req.
Engineering Economics & Management	Nil
Engineering Project Management	Nil
Entrepreneurship	Nil
Principles of Management	Nil
Leadership & Personal Grooming	Nil

BSc ELECTRONIC ENGINEERING SCHEME OF STUDIES

FRAMEWORK SUMMARY

1	Total Credit Hours	Theory	Practical	Total
		107	26/29	133/136
2	Ratio of Non-Engineering to Engineering Subjects	30.82/69.18		
3	Ratio of Theory to Practical Contact Hour	56.91/43.09		
4	One Theory Credit Hour	01 Hour (60 Minutes)		
5	One Practical Credit Hour	03 Hours (180 Minutes)		

Sr. No.	Knowledge Area	Domain	As Per HEC (2015)	As per ENC
1	Humanities	Non-Engineering	19	19
2	Management	Non-Engineering	6	6
3	Natural Sciences	Non-Engineering	16	16
4	Computer	Engineering	8	8
5	Engineering Foundation	Engineering	29	29
6	Major Based Core – Breadth	Engineering	24	24
7	Major Based Core – Depth	Engineering	18/20	18/20
8	Inter-disciplinary Engineering Breadth (Electives)	Engineering	7/8	7/8
9	Senior Design Project	Engineering	6	6
	Total		133/136	133/136
Non-Engineering			30-31%	30-31%
Engineering			69-70%	69-70%

Sr. No.	Detail	Credit Hour			Contact Hour		
		Non-Engineering	Engineering	Total	Non-Engineering	Engineering	Total
1	Theory	40	67	107	40	67	107
2	Practical	1	25/28	26/29	3	75/84	78/87
	Total	41	92/95	133/136	43	142/151	185/194

ACADEMIC CALENDAR

Sr. No.	Detail		Weeks per Semester	Weeks per Year
1	Teaching		16	32
2	Preparation & Examination		04	08
3	Semester Break	Fall	02	12
		Spring + Summer Vacations	10	
	Total			52

FRAMEWORK FOR BSc ELECTRONIC ENGINEERING

SUMMARY: NON-ENGINEERING DOMAIN

Sr. No.	Knowledge Area	Credit Hours	Percentage
1	Humanities	19	46%
2	Management	6	15%
3	Natural Sciences	16	39%
	Total	41	100%

DETAIL: Non-ENGINEERING Domain Courses

Knowledge Area	Sub Area	Name of Course	Theory Contact Hours	Practical Contact Hours	Credit Hours (CH)	Number of Subjects	Total Credit Hours
Humanities	English	Functional English	3	0	3	3	9
		Communication Skills	3	0	3		
		Technical Report Writing & Presentation Skills	3	0	3		
	Culture	Islamic Studies	2	0	2	2	4
		Pakistan Studies	2	0	2		
	Social Sciences	Social Sciences Elective I	3	0	3	2	6
Social Sciences Elective II		3	0	3			
Management Sciences	--	Management Sciences Elective I	3	0	3	2	6
		Management Sciences Elective II	3	0	3		
Natural Sciences	Math	Calculus & Analytical Geometry	3	0	3	4	12
		Linear Algebra	3	0	3		
		Differential Equations	3	0	3		
		Complex Variables & Transforms	3	0	3		
	Physics	Applied Physics	3	3	4	1	4
Total			40	3	41	14	41

SUMMARY: ENGINEERING DOMAIN

Sr. No.	Knowledge Area	Credit Hours	Percentage
1	Computing	8	8.60% / 8.42%
2	Electronic Engineering Foundation	29	31.15% / 30.53%
3	Electronic Engineering Breadth	24	26.10% / 25.26%
4	Electronic Engineering Depth	18/20	19.57% / 21.05%
5	IDEE	7/8	7.66% / 8.42%
6	Technical Project	6	6.52% / 6.31%
	Total	92/95	100.00%

DETAIL: ENGINEERING DOMAIN

Knowledge Area	Name of Course	Theory Contact Hours	Practical Contact Hours	Credit Hours (CH)	Number of Subjects	Total Credit Hours
Computing	Computer Fundamentals & Programming	2	3	3	3	8
	Object Oriented Programming	3	3	4		
	Computer-Aided Engineering Design	0	3	1		
Electronic Engineering Foundation	Linear Circuit Analysis	3	3	4	9	29
	Electronics Workbench	0	3	1		
	Solid-State Electronics	2	0	2		
	Electronic Devices & Circuits	3	3	4		
	Electronic Circuit Design	3	3	4		
	Digital Logic Design	3	3	4		
	Electrical Network Analysis	3	3	4		
	Probability & Random Variables	3	0	3		
	Electromagnetic Field Theory	3	0	3		
Electronic Engineering Breadth	Instrumentation & Measurements	3	3	4	6	24
	Microprocessors & Microcontrollers	3	3	4		
	Electrical Machines	3	3	4		
	Integrated Electronics	3	3	4		
	Signals & Systems	3	3	4		
	Control Systems	3	3	4		
	Digital Signal	3	3	4		

Electronic Engineering Depth	Processing				2	7/8
	Elective-I	3	3	4		
	Elective-II	3	0/3	3/4		
	Elective-IV	3	3	4		
	Elective-V	3	0/3	3/4		
IDEE	Analog & Digital Communication (IDEE I)	3	3	4	2	7/8
	IDEE II	3	0/3	3/4		
Project	Electronic Engineering Project	0	9	3	2	6
	Electronic Engineering Project	0	9	3		
Total		67	75/84	92/95	27	92/95

SCHEME OF STUDIES (SEMESTER WISE)

SUMMARY

Sr. No.	Semester	No. of Subjects	Credit Hours		Total Credit Hours	Contact Hours		Total Contact Hours
			Theory	Practical		Theory	Practical	
1	First*	6	14	4	18	14	12	26
2	Second	6	14	3	17	14	09	23
3	Third	5	15	4	19	15	12	27
4	Fourth	5	14	3	17	14	09	25
5	Fifth	5	15	1	16	15	03	18
6	Sixth	5	14	3	17	14	09	23
7	Seventh*	5	12	4/6	16/18	12	12/18	24/30
8	Eighth	4	09	4/5	13/14	09	12/15	21/24
Total		41	107	26/29	133/136	107	78/87	185/194

DETAIL

1st Semester (First Year)

Sr. No.	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-111	Functional English	Humanities	3	0	3
2	BH-112	Calculus & Analytical Geometry	Natural Science	3	0	3
3	BH-113	Applied Physics	Natural Science	3	1	4
4	CS-114	Computer Fundamentals & Programming	Computing	2	1	3
5	EN-115	Linear Circuit Analysis	Foundation	3	1	4
6	EN-116	Electronics Workbench	Foundation	0	1	1
Semester Credit Hours				14	4	18
				Contact Hours		
Semester Contact Hours				14	12	26

2nd Semester (First Year)

Sr. No.	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-121	Communication Skills	Humanities	3	0	3
2	BH-122	Linear Algebra	Natural Science	3	0	3
3	CS-123	Computer-Aided Engineering Design	Computing	0	1	3
4	CS-124	Object Oriented Programming	Computing	3	1	3
5	EN-125	Solid-State Electronics	Foundation	2	0	4
6	EN-126	Electronic Devices & Circuits	Foundation	3	1	2
Semester Credit Hours				14	3	17
				Contact Hours		
Semester Contact Hours				14	9	23

3rd Semester (Second Year)

Sr. No.	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-211	Differential Equations	Natural Science	3	0	3
2	EN-212	Electronic Circuit Design	Foundation	3	1	4
3	EN-213	Digital Logic Design	Foundation	3	1	4
4	EN-214	Electrical Network Analysis	Foundation	3	1	4
5	EN-215	Instrumentation & Measurements	Breadth	3	1	4
Semester Credit Hours				15	4	19
				Contact Hours		
Semester Contact Hours				15	12	27

4th Semester (Second Year)

Sr. No .	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-221	Complex Variables & Transforms	Natural Science	3	0	3
2	BH-222	Pakistan Studies	Humanities	2	0	2
3	EN-223	Microprocessors & Microcontrollers	Breadth	3	1	4
4	EN-224	Electrical Machines	Breadth	3	1	4
5	EN-225	Integrated Electronics	Breadth	3	1	4
Semester Credit Hours				14	3	17
				Contact Hours		
Semester Contact Hours				14	9	23

5th Semester (Third Year)

Sr. No .	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-311	Social Sciences Elective I	Humanities	3	0	3
2	BH-312	Technical Report Writing & Presentation Skills	Humanities	3	0	3
3	EN-313	Probability & Random Variables	Foundation	3	0	3
4	EN-314	Electromagnetic Field Theory	Foundation	3	0	4
5	BH-315	Signals & Systems	Breadth	3	1	4
Semester Credit Hours				15	1	16
				Contact Hours		
Semester Contact Hours				15	3	18

6th Semester (Third Year)

Sr. No .	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	BH-321	Islamic Studies	Humanities	2	0	2
2	BH-322	Social Sciences Elective II	Humanities	3	0	3
3	EN-323	Analog & Digital Communication	IDEE	3	1	4
4	EN-324	Control Systems	Breadth	3	1	4
5	EN-325	Digital Signal Processing	Depth	3	1	4
Semester Credit Hours				14	3	17
				Contact Hours		
Semester Contact Hours				14	9	23

7th Semester (Fourth Year)

Sr. No.	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	MS-411	Management Sciences Elective I	Humanities	3	0	3
2	EN-4XX	Elective-I	Depth	3	1	4
3	EN-4XX	Elective-II	Depth	3	0/1	3/4
4	XX-4XX	Elective-III	IDEE	3	0/1	3/4
5	EN-499A	Electronic Engineering Project	Project	0	3	3
		Semester Credit Hours		12	4/6	16/18
				Contact Hours		
		Semester Contact Hours		12	12/18	24/30

8th Semester (Fourth Year)

Sr. No.	Code #	Subject	Nature	Theory	Practical	Credit Hours
1	MS-421	Management Sciences Elective II	Humanities	3	0	3
2	EN-4XX	Elective-IV	Depth	3	1	4
3	EN-4xx	Elective-V	Depth	3	0/1	3/4
4	EN-499B	Electronic Engineering Project	Project	0	3	3
		Semester Credit Hours		9	4/5	13/14
				Contact Hours		
		Semester Contact Hours		9	12/15	21/24