

# (Mirpur University of Science & Technology)

## Scheme of Studies B.Sc. Electrical Engineering

### Scheme of Studies 2023-27 (Approved)

<b>Program Duration:</b>		<b>8-14 Semesters (4-7 Academic</b>			
<b>Total number of Credit Hours (CH) inclusive of 6-credit project:</b>		<b>136</b>			
<b>Final Year Project Credits</b>		<b>6</b>			
<b>Internship/Practical Training:</b>		<b>S/U Basis</b>			
<b>Engineering Domain Courses Power Stream:</b>		<b>92</b>			
<b>Engineering Domain Courses Electronics Stream:</b>		<b>92</b>			
<b>Engineering Domain Courses Communication Stream:</b>		<b>92</b>			
<b>Engineering Domain Courses: (Power/ Communication/ Electronics)</b>		<b>92 (67.6%)</b>			
<b>Non-Engineering Domain Courses:</b>		<b>44 (32.3%)</b>			
<b>(Basic Sciences/ Arts/ Humanitites)</b>					
<b>* Both Theory and Lab must be passed for all Pre-Requisite Courses.</b>					
<b>Semester 1</b>					
<b>Code</b>	<b>Course Title</b>	<b>Knowledge Area</b>	<b>Cr. Hrs.</b>	<b>Ct. Hrs.</b>	<b>Pre-req.*</b>
BEE-1101	Linear Circuit Analysis	Foundation	3	3	
BEE-1101L	Linear Circuit Analysis Lab		1	3	
BEE-1102L	Workshop Practice Lab		1	3	
ENG-1103	Functional English	Humanities and Social Sciences	3	3	
MAT-1105	Calculus and Analytical Geometry	Natural Sciences	3	3	
PHY-1108	Applied Physics		2	2	
PHY-1108L	Applied Physics Lab		1	3	
ICT-1126	Applications of Information and Communication Technologies	Social Science	2	2	
ICT-1126L	Applications of Information and Communication Technologies Lab		1	3	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
CHE-0004	Chemistry^	Remedial Course	S/U	3	
CHE-0004L	Chemistry Lab^			3	
<b>Total</b>			<b>17</b>	<b>32</b>	

^ Remedial course only for ICS students

Semester 2					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE -1201	Programming Fundamentals	Computing	3	3	
BEE -1201L	Programming Fundamentals Lab		1	3	
MDE -1202	Health Safety and Environment	IDEED-I	1	1	
BEE -1203	Electronic Devices and Circuits	Foundation	3	3	
BEE -1203L	Electronic Devices and Circuits Lab		1	3	
MAT-1204	Linear Algebra	Natural Sciences	3	3	
ISL-1212	Islamic Studies/ Ethics (for non-muslims)	Humanities and Social Sciences	2	2	
QTR-1227	Quantitative Reasoning-I		3	3	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			17	22	

Semester 3					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-2301	Electrical Network Analysis	Foundation	3	3	BEE-1101, BEE-1101L
BEE-2301L	Electrical Network Analysis Lab		1	3	
BEE-2302	Data Structures and Algorithms	Computing	2	2	BEE-1201, BEE-1201L
BEE-2302L	Data Structures and Algorithms Lab		1	3	
BEE-2303	Digital Logic Design	Foundation	3	3	
BEE-2303L	Digital Logic Design Lab		1	3	
MAT-2305	Differential Equations	Natural Sciences	3	3	
ICP-2329	Ideology and Constitution of Pakistan	Humanities and	2	2	
CEE-2330	Civics and Community Engagemenent	Humanities and	2	2	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			18	25	

Semester 4					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-2401	Electrical Machines	Core (Breadth)	3	3	
BEE-2401L	Electrical Machines Lab		1	3	
BEE-2402	Signal and Systems	Foundation	3	3	
BEE-2402L	Signal and Systems Lab		1	3	
BEE-2403	Probability Methods in Engineering	Foundation	2	2	
BEE-2404L	Engineering Drawing Lab		1	3	
MAT-2406	Complex Variables and Transforms	Natural Sciences	3	3	
ENG-2407	Expository Writing*	Humaities	3	3	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			17	24	

Semester 5					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-3501	Linear Control Systems	Core (Breadth)	3	3	
BEE-3501L	Linear Control Systems Lab		1	3	
BEE-3502	Microprocessor Systems	Core (Breadth)	2	2	
BEE-3502L	Microprocessor Systems Lab		1	3	
BEE-3503	Electromagnetic Field Theory	Foundation	3	3	
MDE-3504	Geoinformatics	IDEE-II	1	1	
MDE-3504L	Geoinformatics Lab		1	3	
ARA-3501	Arabic	Humanities and Social Sciences	2	2	
MAN-3511	Project Management		2	2	
ETH-3532	Professional Ethics		2	2	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			18	25	

Semester 6					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-3601	Communication Systems	Core (Breadth)	3	3	BEE-2402, BEE-2402L
BEE-3601L	Communication Systems Lab		1	3	
BEE-3602	Instrumentation and Measurements	Depth Elective (P/E/C)	3	3	
BEE-3602L	Instrumentation and Measurements Lab		1	3	
	Inter Deciplinary Engineering Elective	IDEE	3	3	
ETR-3608	Entrepreneurship	Humanities and Social Sciences	2	2	
QTR-3628	Quantitative Reasoning-II	Natural Sciences	3	3	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			16	21	

Semester 7 (Power)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-4701	Power System Analysis	Breadth Core-I (P)	3	3	
BEE-4701L	Power System Analysis Lab		1	3	
BEE-4702	Power Distribution and Utilization	Breadth Core-II (P)	3	3	
BEE-4702L	Power Distribution and Utilization Lab		1	3	
BEE-4703	Power Generation	Depth Elective (P)	3	3	
BEE-4704	Power Electronics		3	3	
BEE-4704L	Power Electronics Lab		1	3	
BEE-4805	Final Year Project - I	Senior Design Project	3	9	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			18	31	

Semester 7 (Electronics)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-4701	Introduction to Nanotechnology	Depth Elective (E)	3	3	
BEE-4702	Digital System Design	Depth Elective (E)	3	3	BEE-2303, BEE-2303L
BEE-4702L	Digital System Design Lab		1	3	
BEE-4703	Electronic Circuit Design	Breadth Core-I (E)	3	3	
BEE-4703L	Electronic Circuit Design Lab		1	3	
BEE-4704	Power Electronics	Breadth Core-II (E)	3	3	
BEE-4704L	Power Electronics Lab		1	3	
BEE-4805	Final Year Project - I	Senior Design Project	3	9	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			18	31	

Semester 7 (Communication)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-4701	Digital Communication	Depth Elective (C)	3	3	
BEE-4702	Computer Communication Networks	Breadth Core-I (C)	3	3	
BEE-4702L	Computer Communication Networks Lab		1	3	
BEE-4703	Electronic Circuit Design	Breadth Core-II (C)	3	3	
BEE-4703L	Electronic Circuit Design Lab		1	3	
BEE-4704	Digital Signal Processing	Depth Elective (C)	3	3	BEE-2402, BEE-2420L
BEE-4704L	Digital Signal Processing Lab		1	3	
BEE-4805	Final Year Project	Senior Design Project	3	9	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			18	31	

Semester 8 (Power/ Electronics/ Communication)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
	Engineering Depth Elective-I (Power/ Electronics/ Communication)	Depth Elective (P/E/C)	3	3	
	Engineering Depth Elective-I Lab (Power/ Electronics/ Communication)		1	3	
	Engineering Depth Elective-II (Power/ Electronics/ Communication)	Depth Elective (P/E/C)	3	3	
	Engineering Depth Elective-II Lab (Power/ Electronics/ Communication)		1	3	
	Engineering Depth Elective-III (Power/ Electronics/ Communication)	Depth Elective (P/E/C)	3	3	
	Engineering Depth Elective-III Lab (Power/ Electronics/ Communication)		1	3	
BEE-4805	Final Year Project	Senior Design Project	3	9	
HQT-1128	Holy Quran with Translation, Tajveed and Tafseer		S/U	1	
Total			15	29	

List of Elective Courses (Power)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-48E1	Power System Protection	Depth Electives	3	3	
BEE-48E1L	Power System Protection Lab		1	3	
BEE-48E2	Renewable Energy Systems		3	3	
BEE-48E2L	Renewable Energy Systems Lab		1	3	
BEE-48E3	Power System Operation and Control		3	3	
BEE-48E3L	Power System Operation and Control Lab		1	3	
BEE-48E4	Smart Grid		3	3	
BEE-48E4L	Smart Grid Lab		1	3	
BEE-48E5	High Voltage Engineering		3	3	
BEE-48E5L	High Voltage Engineering Lab		1	3	
BEE-48E6	Machine Learning		3	3	
BEE-48E6L	Machine Learning Lab		1	3	
BEE-48E7	Electrical Machine Design		3	3	
BEE-48E7L	Electrical Machine Design Lab		1	3	
BEE-48E8	Electrical Power Transmission		3	3	
BEE-48E8L	Electrical Power Transmission Lab		1	3	
BEE-48E9	Data Communication		3	3	
BEE-48E9L	Data Communicaiton Lab		1	3	
BEE-48EA	Internet of Things		3	3	
BEE-48EAL	Internet of Things Lab		1	3	

List of Elective Courses (Electronics)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-48E1	VLSI Design	Depth Electives	3	3	
BEE-48E1L	VLSI Design lab		1	3	
BEE-48E2	Embedded System Design		3	3	
BEE-48E2L	Embedded System Design Lab		1	3	
BEE-48E3	Opto-electronics		3	3	
BEE-48E3L	Opto-electronics Lab		1	3	
BEE-48E4	Medical Robotics		3	3	
BEE-48E4L	Medical Robotics Lab		1	3	
BEE-48E5	RF and Microwave Engineering		3	3	BEE-3503
BEE-48E5L	RF and Microwave Engineering Lab		1	3	
BEE-48E6	Machine Learning		3	3	
BEE-48E6L	Machine Learning Lab		1	3	
BEE-48E7	Biomedical Instrumentation		3	3	
BEE-48E7L	Biomedical Instrumentation Lab		1	3	
BEE-48E8	Wave Propagation and Antennas		3	3	BEE-3503
BEE-48E8L	Wave Propagation and Antennas Lab		1	3	
BEE-48E9	Data Communication		3	3	
BEE-48E9L	Data Communicaiton Lab		1	3	
BEE-48EA	Internet of Things		3	3	
BEE-48EAL	Internet of Things Lab		1	3	
BEE-48EB	Integrated Electronics		3	3	
BEE-48EBL	Integrated Electronics Lab		1	3	
BEE-48EC	Digital Signal Processing		3	3	BEE-2402, BEE-2402L
BEE-48EBL	Digital Signal Processing Lab		1	3	

List of Elective Courses (Communication)					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BEE-48E1	Wireless and Mobile Communications	Depth Electives	3	3	
BEE-48E1L	Wireless and Mobile Communications Lab		1	3	
BEE-48E2	Optical Communicaiton		3	3	
BEE-48E2L	Optical Communicaiton Lab		1	3	
BEE-48E3	Navigation and Radar Systems		3	3	
BEE-48E3L	Navigation and Radar Systems Lab		1	3	
BEE-48E4	Digital Image Processing		3	3	
BEE-48E4L	Digital Image Processing Lab		1	3	
BEE-48E5	RF and Microwave Engineering		3	3	BEE-3503
BEE-48E5L	RF and Microwave Engineering Lab		1	3	
BEE-48E6	Artificial Intelligence		3	3	
BEE-48E6L	Artificial Intelligence Lab		1	3	
BEE-48E7	Biomedical Instrumentation		3	3	
BEE-48E7L	Biomedical Instrumentation Lab		1	3	
BEE-48E8	Wave Propagation and Antennas		3	3	BEE-3503
BEE-48E8L	Wave Propagation and Antennas Lab		1	3	
BEE-48E9	Data Communication		3	3	
BEE-48E9L	Data Communicaiton Lab		1	3	
BEE-48EA	Internet of Things		3	3	
BEE-48EAL	Internet of Things Lab		1	3	
BEE-48E9	Satellite Communication		3	3	
BEE-48E9L	Satellite Communication Lab		1	3	
List of IDEEs					
Code	Course Title	Knowledge Area	Cr. Hrs.	Ct. Hrs.	Pre-req.*
BME-36E1	Engineering Mechanics		3	3	
BME-36E2	Applied Thermodynamics		3	3	