

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

COURSE DETAILS



INTRODUCTION TO B.S.E.E

The Electrical Engineering Program at SS CASE IT has an exceptional blend of theoretical research and extensive practical training to mould students into skillful professionals ready to take up real world challenges in the industry. A strong curriculum is offered by highly qualified engineering faculty with reputable accomplishments in research, academic publications and industrial projects.

Our Electrical Engineering Program is the first Electrical Engineering Program in Pakistan to receive Level 2 Accreditation from Pakistan Engineering Council (PEC) under the new OBE Accreditation System. PEC also has the signatory status for the Washington Accord. Washington Accord is an international agreement among bodies responsible for reciprocal accreditation of engineering degree programs. Among the signatories are Australia, Canada, Japan, Malaysia, Russia, Singapore, South Africa, UK and USA. Graduates of our BSEE Program can directly apply for jobs in these countries

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

The educational objectives of the Bachelor of Science in Electrical Engineering program are to graduate students who have the following attributes five years after their graduation:

1. The graduates are competent to solve technical problems using engineering principles, tools and practices in an ethical and responsible manner.
2. The graduates are able to think critically and creatively, especially about the use of technology to address local and global problems.
3. The graduates are able to communicate effectively and have the necessary skills to lead and engage in a globally competitive world.
4. The graduates are able to utilize formal and informal learning opportunities to maintain and enhance technical, personal and professional growth.

STUDY PLAN FOR B.S.E.E

Semester - 1

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• CS101	INTRODUCTION TO COMPUTING	1-3-2	FRESHMAN STANDING
• HU101	FUNCTIONAL ENGLISH	3-0-3	FRESHMAN STANDING
• HU112	ISLAMIC IDEOLOGY	2-0-2	FRESHMAN STANDING
• MA101	CALCULUS AND ANALYTICAL GEOMETRY	3-0-3	FRESHMAN STANDING
• MT111	MECHANICS (IDE I)	3-0-3	FRESHMAN STANDING
• PH101	ELECTRICITY & MAGNETISM	3-0-3	FRESHMAN STANDING

Semester - 2

CODE		HOURS	PRE-REQUISITE
• CS102	PROGRAMMING FUNDAMENTALS	3-3-4	FRESHMAN STANDING
• EE101	ENGINEERING DRAWING	0-3-1	FRESHMAN STANDING
• EE111	ELECTRIC CIRCUIT ANALYSIS	3-3-4	ELECTRICITY & MAGNETISM
• HU102	COMMUNICATION SKILLS & TECHNICAL WRITING	3-0-3	FUNCTIONAL ENGLISH
• MA102	DIFFERENTIAL EQUATIONS	3-0-3	CALCULUS & ANALYTICAL GEOMETRY
• MA103	MULTIVARIABLE CALCULUS	2-0-2	CALCULUS & ANALYTICAL GEOMETRY

Semester - 3

CODE		HOURS	PRE-REQUISITE
• CS203	OOP AND DATA STRUCTURES USING C++	3-3-4	PROGRAMMING FUNDAMENTALS
• EE212	ELECTRIC CIRCUIT ANALYSIS 2	3-3-4	ELECTRIC CIRCUIT ANALYSIS 1
• EE241	DIGITAL LOGIC DESIGN	3-3-4	SOPHOMORE STANDING
• HU223	PAKISTAN STUDIES	2-0-2	SOPHOMORE STANDING
• MA204	COMPLEX VARIABLES AND TRANSFORMS	2-0-2	CALCULUS & ANALYTICAL GEOMETRY
• MA205	NUMERICAL ANALYSIS	2-0-2	CALCULUS & ANALYTICAL GEOMETRY

STUDY PLAN FOR B.S.E.E

Semester - 4

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE 221	SIGNALS AND SYSTEMS	3-3-4	COMPLEX VARIABLES & TRANSFORMS
• EE 231	ELECTRONIC DEVICES & CIRCUITS	3-3-4	ELECTRIC CIRCUIT ANALYSIS 2
• EE 242	MICROPROCESSOR & COMPUTER ARCHITECTURE	3-3-4	DIGITAL LOGIC DESIGN
• EE 271	ELECTROMECHANICAL SYSTEMS	3-3-4	ELECTRIC CIRCUIT ANALYSIS 2
• MA 206	LINEAR ALGEBRA	3-0-3	SOPHOMORE STANDING

Semester - 5

CODE	HOURS	PRE-REQUISITE	
• EEXXX	BREADTH CORE 1	3-3-4	AS PER SPECIFIC COURSE
• EE 342	MICROPROCESSOR BASED EMBEDDED SYSTEM DESIGN	3-3-4	MICROPROCESSOR & COMPUTER ARCHITECTURE
• EE 351	COMMUNICATION SYSTEMS	3-3-4	SIGNALS AND SYSTEMS
• EE 381	CONTROL SYSTEMS	3-3-4	LINEAR ALGEBRA, SIGNALS & SYSTEMS
• MA 307	PROBABILITY & RANDOM VARIABLES	3-0-3	CALCULUS & ANALYTICAL GEOMETRY

Semester - 6

CODE	HOURS	PRE-REQUISITE	
• EE 361	ELECTROMAGNETIC THEORY	3-0-3	ELECTRICITY AND MAGNETISM
• EEXXX	DEPTH ELECTIVE 1	3-3-4	AS PER SPECIFIC COURSE
• EEXXX	BREADTH CORE 2	3-3-4	AS PER SPECIFIC COURSE
• EEXXX	DEPTH ELECTIVE 2	3-3-4	AS PER SPECIFIC COURSE
• MT 382	INDUSTRIAL AUTOMATION (IDE 2)	3-3-4	MICROPROCESSOR BASED EMBEDDED SYSTEMS DESIGN, CONTROL SYSTEMS

STUDY PLAN FOR B.S.E.E

Semester - 7

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE491	SENIOR YEAR DESIGN PROJECT 1	0-9-3	92 CREDIT HOURS
• EE4XX	DEPTH ELECTIVE 3	3-X-X	AS PER SPECIFIC COURSE
• EE4XX	DEPTH ELECTIVE 4	3-X-X	AS PER SPECIFIC COURSE
• EM412	ENGINEERING PROJECT MANAGEMENT	3-0-3	SENIOR STANDING
• HU422	PROFESSIONAL ETHICS	2-0-2	SENIOR STANDING

Semester - 8

CODE		HOURS	PRE-REQUISITE
• EE492	SENIOR YEAR DESIGN PROJECT 2	0-9-3	SENIOR YEAR DESIGN PROJECT 1
• EE4XX	DEPTH ELECTIVE 5	3-X-X	AS PER SPECIFIC COURSE
• EM401	ENGINEERING ECONOMICS	3-0-3	SENIOR STANDING
• EM423	ENTREPRENEURSHIP	3-0-3	SENIOR STANDING
• HU431	PHILOSOPHY	2-0-2	SENIOR STANDING

POWER ENGINEERING ELECTIVES

Breadth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE332	ELECTRONIC DESIGN & PRACTICE	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE372	POWER DISTRIBUTION & UTILIZATION	3-3-4	ELECTRIC CIRCUIT ANALYSIS

Depth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE422	DIGITAL SIGNAL PROCESSING	3-3-4	SIGNALS & SYSTEMS
• EE433	POWER ELECTRONICS	3-3-4	ELECTRONICS DEVICES & CIRCUITS
• EE454	DATA COMMUNICATION NETWORKS	3-3-4	PROGRAMMING FUNDAMENTALS
• EE470	POWER SYSTEM ANALYSIS	3-3-4	ELECTROMECHANICAL SYSTEMS
• EE471	POWER GENERATION	3-3-4	POWER DISTRIBUTION & UTILIZATION
• EE473	ELECTRICAL POWER TRANSMISSION	3-3-4	POWER DISTRIBUTION & UTILIZATION
• EE474	POWER SYSTEM PROTECTION	3-3-4	POWER DISTRIBUTION & UTILIZATION
• EE475	POWER SYSTEM STABILITY & CONTROL	3-0-3	POWER SYSTEM ANALYSIS
• EE476	SMART GRIDS	3-0-3	POWER SYSTEM ANALYSIS & COMMUNICATION SYSTEMS
• EE477	RENEWABLE ENERGY SYSTEMS	3-0-3	POWER SYSTEM ANALYSIS
• EE478	FUNDAMENTALS OF HIGH VOLTAGE ENGINEERING	3-3-4	ELECTROMAGNETIC THEORY
• EE479	ADVANCED ELECTRICAL MACHINES DESIGN	3-3-4	ELECTROMECHANICAL SYSTEMS
• EE484	DIGITAL CONTROL SYSTEM	3-0-3	CONTROL SYSTEMS

COMPUTER ENGINEERING ELECTIVES

Breadth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE332	ELECTRONIC DESIGN & PRACTICE	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE454	DATA COMMUNICATION NETWORKS	3-3-4	PROGRAMMING FUNDAMENTALS

Depth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE422	DIGITAL SIGNAL PROCESSING	3-3-4	SIGNALS & SYSTEMS
• EE423	DIGITAL IMAGE PROCESSING	3-3-4	DIGITAL SIGNAL PROCESSING
• EE440	ADVANCE TOPICS IN COMPUTER SYSTEMS	3-0-3	MICROPROCESSOR & COMPUTER ARCHITECTURE, PROGRAMMING FUNDAMENTALS
• EE445	DIGITAL SYSTEMS DESIGN	3-3-4	DIGITAL LOGIC DESIGN
• EE446	OPERATING SYSTEM	3-3-4	MICROPROCESSOR & COMPUTER ARCHITECTURE
• EE447	PARALLEL PROCESSING	3-3-4	MICROPROCESSOR & COMPUTER ARCHITECTURE, PROGRAMMING FUNDAMENTALS
• EE444	DATABASE MANAGEMENT SYSTEMS	3-3-4	OOP & DATA STRUCTURES USING C++
• EE455	NETWORK & SYSTEM PROGRAMMING	3-3-4	PROGRAMMING FUNDAMENTALS, DATA COMMUNICATION NETWORKS
• EE456	NETWORK SECURITY	3-0-3	SENIOR STANDING

TELECOMMUNICATION ENGINEERING ELECTIVES

Breadth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE332	ELECTRONIC DESIGN & PRACTICE	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE454	DATA COMMUNICATION NETWORKS	3-3-4	PROGRAMMING FUNDAMENTALS

Depth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE422	DIGITAL SIGNAL PROCESSING	3-3-4	SIGNALS & SYSTEMS
• EE423	DIGITAL IMAGE PROCESSING	3-3-4	DIGITAL SIGNAL PROCESSING
• EE433	POWER ELECTRONIC	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE445	DIGITAL SYSTEM DESIGN	3-3-4	DIGITAL LOGIC DESIGN
• EE450	ADVANCE TOPICS IN TELECOMMUNICATIONS ENGINEERING	3-0-3	DIGITAL COMMUNICATION
• EE452	WIRELESS COMMUNICATIONS	3-0-3	DIGITAL COMMUNICATION
• EE453	DIGITAL COMMUNICATION	3-3-4	COMMUNICATION SYSTEMS, PROBABILITY & RANDOM VARIABLES
• EE457	TELECOM SWITCHING & SIGNALING SYSTEMS	3-0-3	COMMUNICATION SYSTEMS
• EE458	OPTICAL & HIGH SPEED NETWORKS	3-0-3	COMMUNICATION SYSTEMS
• EE462	ANTENNA DESIGN & MICROWAVE ENGINEERING	3-3-4	ELECTROMAGNETIC THEORY
• EE464	RADAR SYSTEMS	3-0-3	COMMUNICATION SYSTEMS

ELECTRONICS ENGINEERING ELECTIVES

Breadth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE332	ELECTRONIC DESIGN & PRACTICE	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE454	DATA COMMUNICATION NETWORKS	3-3-4	PROGRAMMING FUNDAMENTALS

Depth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE422	DIGITAL SIGNAL PROCESSING	3-3-4	SIGNALS & SYSTEMS
• EE423	DIGITAL IMAGE PROCESSING	3-3-4	DIGITAL SIGNAL PROCESSING
• EE430	ADVANCED TOPICS IN ELECTRONICS	3-0-3	ELECTRONIC DESIGN & PRACTICE
• EE433	POWER ELECTRONICS	3-3-4	ELECTRIC CIRCUIT ANALYSIS 2, ELECTRONIC DEVICES & CIRCUITS
• EE434	INDUSTRIAL ELECTRONICS	3-0-3	ELECTRONIC DESIGN & PRACTICE
• EE435	SOLID STATE DEVICES	3-0-3	ELECTRONIC DEVICES & CIRCUITS
• EE436	OPTO-ELECTRONICS	3-0-3	SENIOR STANDING
• EE437	MICRO ELECTRONICS	3-0-3	ELECTRONIC DESIGN & PRACTICE
• EE438	VLSI DESIGN	3-0-3	DIGITAL SYSTEM DESIGN
• EE445	DIGITAL SYSTEM DESIGN	3-3-4	DIGITAL LOGIC DESIGN
• EE448	DIGITAL ELECTRONICS	3-3-4	DIGITAL LOGIC DESIGN
• EE463	RF & MICROWAVE ENGINEERING	3-0-3	ELECTROMAGNETIC THEORY, ELECTRONIC DESIGN & PRACTICE
• EE465	ELECTRONIC WARFARE	3-0-3	COMMUNICATION SYSTEMS

CONTROLS ENGINEERING ELECTIVES

Breadth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE332	ELECTRONIC DESIGN & PRACTICE	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE454	DATA COMMUNICATION NETWORKS	3-3-4	PROGRAMMING FUNDAMENTALS

Depth core courses

CODE	COURSE TITLE	HOURS	PRE-REQUISITE
• EE422	DIGITAL SIGNAL PROCESSING	3-3-4	SIGNALS & SYSTEMS
• EE433	POWER ELECTRONICS	3-3-4	ELECTRONIC DEVICES & CIRCUITS
• EE445	DIGITAL SYSTEM DESIGN	3-3-4	DIGITAL LOGIC DESIGN
• EE481	DIGITAL CONTROL SYSTEM	3-3-4	CONTROL SYSTEMS
• EE482	ADVANCED PROCESS CONTROL	3-0-3	CONTROL SYSTEMS
• EE483	INTELLIGENT CONTROL	3-0-3	CONTROL SYSTEMS
• EE484	ADVANCED ROBOTICS & CONTROL	3-0-3	CONTROL SYSTEMS
• EE485	ROBOTIC SYSTEM DESIGN	3-3-4	INDUSTRIAL AUTOMATION
• EE486	ADVANCED TOPICS IN CONTROL THEORY	3-0-3	CONTROL SYSTEMS
• EE423	DIGITAL IMAGE PROCESSING	3-3-4	DIGITAL SIGNAL PROCESSING