COMPUTER ENGINEERING
CLASS OF 2026

ACADEMIC DOSSIER

OFFICE OF UNDERGRADUATE EDUCATION & ACCREDITATION

Table of Contents

#	Revision Description	Date Revised	Approved By	Date Approved
1.0	New document	N/A	BoF	24/06/22

COMPUTER ENGINEERING

PROGRAM DESCRIPTION:

The two disciplines of Electrical Engineering and Computer Engineering have reshaped the way we live and think about our lives today, be it in the form of electronic devices, computers, communication networks in use, or new technologies in transport, agriculture, medicine, manufacturing, or commerce. Ideas from Electrical and Computer Engineering are even enhancing our understanding of other disciplines, such as Biology, Finance, and Economics. In upcoming decades, Electrical and Computer Engineers will play a pivotal role in tackling key challenges faced by our present society, such as the need for affordable and clean sources of energy and transport, advancements in health, resilient infrastructure, or imagining future of industry, to name a few. Keeping this state in view, the vision of the Electrical and Computer Engineering program is to shape electrical engineers and computer engineers who will assume a leadership role in pursuit of tackling these key challenges faced by our society.

Vision of Electrical and Computer Engineering program

Be an agent of positive change in society through excellence in locally contextualized and globally competitive liberal-arts and discipline-specific education and research, and imparting an understanding of contemporary issues and challenges facing the society.

PROGRAM EDUCATIONAL OBJECTIVES:

Electrical Engineering program at Habib University aims to produce competent electrical engineers who;

1. Exhibit broad-based technical excellence in their engineering practice and in other professional dealings.

2. Are aware of the impact of their work on society and environment.

3. Are capable of leading through a pluralistic approach.

4. Engage in the lifelong process of independent and reflective learning.

PROGRAM LEARNING OUTCOMES:

Upon graduation, students will have the following abilities:

1. Engineering Knowledge: an ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems;

2. Problem Analysis: an ability to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering;

3. Design of solutions: an ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations;

4. Investigation: an ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions;

5. Modern tool usage: an ability to create, select and apply appropriate techniques, resources, and modern engineering tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations;

6. Contextual Awareness: an ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems;

7. Environment and Sustainability: an ability to understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate knowledge of and need for sustainable development;

8. Ethics: the ability to apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice;

9. Collaboration: an ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings;

10. Communication: an ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large;

11. Project Management: an ability to demonstrate management skills as a member and/or leader in a team, to manage projects in a multidisciplinary environment;

12. Lifelong learning: an ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

MAPPING OF PLOS TO UNIVERSITY LEARNING GOALS:

PROGRAM LEARNING OUTCOMES - MAPPING

PLO	Title	Program Learning Outcomes	Knowledge — Breadth & Depth (ULG 01)	Interdisciplinary & — Synthesis & Connections (ULG 02)	Context — Contextually Grounded (ULG 03)	Creativity & — Imaginative & Interesting (ULG 04)	Critical Inquiry — Analysis & Critical Thought (ULG 05)	Communication & — Interaction & Teamwork (ULG 06)	Social Impact — Service & Sustainability (ULG 07)	Thought — Yohsin Values & Lifelong Learning (ULG 08)	Ethical & Cultural — Personal & Professional Ethics (ULG 09)
			Know			**Act**			**Value**		
1	Engineering Knowledge	An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems	S								
2	Problem Analysis	an ability to identify, formulate, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering	S	S			S				
3	Design of Solutions	An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations		W	W	S			W		
4	Investigation	An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions		S			S				
5	Modern Tool Usage	An ability to create, select and apply appropriate techniques, resources, and modern engineering tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations	S	S			S				
6	Contextual Awareness	An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems		S	S	W			W		
7	Environment and Sustainability	An ability to understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate knowledge of and need for sustainable development							S		
8	Ethics	The ability to apply ethical principles and commit to professional ethics, responsibilities, and norms of engineering practice									S
9	Collaboration	An ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings						S			
10	Communication	An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large						S			
11	Project Management	An ability to demonstrate management skills as a member and/or leader in a team, to manage projects in a multidisciplinary environment									
12	Lifelong Learning	An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments								S	

Legend Competencies
S: Strongly - Program Learning Outcome strongly maps to the University Learning Goal
W: Weakly - Program Learning Outcome strongly maps to the University Learning Goal

REQUIRED COURSES:

CE/EE 100: Introduction to Electrical & Computer Engineering
Credit Hours: 0+2
Fulfils: CE foundation, EE foundation, ECE Minor foundation
Corequisite: CS 101

Through a series of projects, this course aims to expose the students, having little or no prior exposure, to the fascinating world of electrical and computer engineering. The course will allow the students to gain an appreciation for the history and possible futures of various disciplines within electrical and computer engineering. Students will spend most of their time in the lab working on these projects with classroom instruction for support. The course will introduce basic electrical concepts including charge, voltage, current, energy, power, resistance, capacitance, inductance, and Kirchoff's laws. Practical digital and analog electronic systems will also be introduced to illustrate advanced topics that are treated completely in subsequent electrical engineering courses.

CE/EE 112: Electric Circuits-I
Credit Hours: 2+0
Fulfils: CE Foundation, EE Foundation, ECE Minor Foundation

This course introduces basic DC and AC steady-state analysis for linear circuits. Topics discussed in this course include circuit elements, Ohm's law and Kirchhoff's laws, node and mesh analysis, energy storage elements, Thevenin and Norton theorems, Phasors and sinusoidal steady state analysis. Computer applications in circuit simulation and numerical solution is also discussed.

CS 101: Programming Fundamentals
Credit Hours: 2+1
Prerequisite: None
Fulfils: CE Foundation

Motivates computer programming as a means to solve problems; introduces the basic components of problem solving: repetition, decision making, data storage and manipulation, input/output, modularity, top-down design; develops expertise in the corresponding constructs – variables, data types, iteration, conditionals, functions, file and console I/O, and recursion – in a high-level programming language.

CE 171: Data Structures and Algorithms
Credit Hours: 3+1
Prerequisite: CS 101
Fulfills: Engineering Sciences and Computing

Motivates the design of algorithms by exploring various algorithms for a single task: linear search and binary search, bubble sort, insertion sort, selection sort, merge sort, quick sort; introduces techniques to reason about and compare algorithms: asymptotic analysis and notation, Master theorem; introduces frequently used data structures: list, tree, graph, stack, queue; discusses and analyzes basic operations on the data structures: infix, postfix, and prefix traversal, breadth-first and depth-first search, computation of graph.

CE/EE 211: Basic Electronics
Credit Hours: 3+1
Fulfils: CE Electronics, ECE Minor Foundation

The course aims to introduce students to semiconductor devices, with emphasis on application of these devices in realizing analog and digital electronic circuits. The course starts with an introduction to semiconductors, energy bands, valence bonds, doping, n-type and p-type semi-conductors. The electronic devices, such as PN junction diode, bipolar junction transistor (BJT) and Metal-oxide semiconductor field-effect transistor (MOSFET), along with their applications are discussed in detail. Biasing circuits, single

transistor amplifiers and their frequency are also discussed. Circuit simulations using PSpice (OrCAD) forms an important bridge between the theory discussed in class and lab experiments.

CE 222/EE 172/CS 130: Digital Logic and Design
Credit Hours: 3+1
Fulfils: CE Computing Systems, ECE Minor Foundation

Introduction to the design of digital hardware, realization of computation with logic gates; Boolean algebra, design of combinational logic circuits, and analysis and design of clocked sequential logic circuits, circuits for arithmetic operations; introduction to hardware description language and its application to logic design. (Cross-listed with CS 130.)

CE 251/EE 252: Signals and Systems
Credit Hours: 3+1
Fulfils: CE Information Systems, ECE Minor Foundation

The topics covered in this course include types of signals; unit impulse and unit step functions; linear time invariant (LTI) systems and their properties; convolution sum and convolution integral; Fourier series, Fourier, Laplace and Z transforms; analysis and characterization of LTI systems using various transforms, Sampling.

CE 362/EE 355/MATH 322: Statistics and Inferencing
Credit Hours: 3+0
Fulfils: CE Engineering Sciences and Computing

Introduces probabilistic modelling for problems of inference and machine learning from data, emphasizing analytical and computational aspects. Distributions, marginalization, conditioning, and structure, including graphical and neural network representations. Belief propagation, decision-making, classification, estimation, and prediction. Sampling methods and analysis. Introduces asymptotic analysis and information measures. Computer simulation-based computational component explores the concepts introduced in class in the context of contemporary applications. Students design inference algorithms, investigate their behavior on real data, and discuss experimental results.

CE 272: Object Oriented Programming
Credit Hours: 3+1
Fulfils: CE Algorithms and Software

Introduces object oriented and related memory concepts; motivates C++ as the language of choice; topics include: pointers and structs, objects, heap allocation, data encapsulation, classes, namespaces, constructors and destructors, virtual functions and destructors, operator overloading and standard input/output, inheritance and polymorphism, templates, standard library containers, and software design using UML 2.0.

CE/EE 301: Electrical & Computer Engineering Seminar
Credit Hours: 1+0
Fulfils: CE Core, EE Core

Through a series of weekly seminars by researchers and engineers working in the domain of Electrical Engineering, this course achieves the following objectives:

Exposure to various sub-disciplines in Electrical Engineering, their corresponding electives at HU, and that state of research in that sub-discipline; Strengthen the commitment to professional and ethical practice of engineering; Awareness of some theoretical ideas in Electrical Engineering, not covered in other courses.

CE 321: Computer Architecture
Credit Hours: 3+1
Fulfils: CE Computing Systems, ECE Minor Elective

Studies the architecture of processors that enable general purpose computing and develops hands-on expertise in developing complex logical components. Topics include instruction set architecture, addressing modes, processor design and computer arithmetic, pipelining, memory systems, fetch execution cycle, processor implementation on FPGA using Verilog HDL.

CE 324: Operating Systems
Credit Hours: 3+1
Fulfils: CE Computing Systems

The student will be taught principles of modern operating systems. In particular, the course will cover details of concurrent processes, multi-threads, CPU scheduling, memory management, file system, storage subsystem, and input/output management. This will be accomplished by integrating theory and practice through coordinated lecture and lab hours.

CE 325: Digital Systems Design
Credit Hours: 3+0
Fulfils: CE Computing Systems

This course is currently under development.

CE 332/EE 376: Microcontrollers and Interfacing
Credit Hours: 0+1
Fulfils: CE Computing Systems, EE Core, ECE Minor Elective
Prerequisite: CE 222/CS 130/EE 172

Microcontrollers play a central role in modern life, controlling everything from the engine of a car, to domestic and office machinery. Microcontroller fundamentals including architecture, assembly language programming, and interfacing. Applications of industry-standard microcontrollers in embedded systems. Employs software design tools, simulators, and hardware trainers. Will focus on interfacing the ARM RISC processor to motors, actuators and sensors.

CE 341: Data Communication & Networking
Credit Hours: 3+1
Fulfils: CE Networking and Security, ECE Minor Elective

It is the first course on networking therefore no prior background is expected. This course will not only introduce students to the basics of the communication of data in the networks of computer but will also enable to develop some insight towards the core issues related to the communication models and different network devices.

CE 352: Digital Signal Processing
Credit Hours: 3+1
Fulfils: CE Information Systems, ECE Minor Elective

Introduction to digital signal representations in time and frequency domains; signal manipulations via filters and resampling; signal creation and capture and processing with real-time computing machinery.

CE 361/EE 354/MATH 310: Introduction to Probability and Statistics
Credit Hours: 3+0
Fulfils: CE Engineering Sciences and Computing

Set theory and counting principles, axiomatic definition of probability, independence and conditional probability, Bayes' theorem; random variables (RVs) and their cumulative distribution function, probability mass functions, probability density functions and moments; joint RVs; limits theorems; statistics; applications.

CE 374: Software Engineering

Credit Hours: 3+0
Fulfils: CE Algorithms and Software

Approaches software engineering as the study and practice of a collection of concepts, techniques and tools which enable programmers to design, build, and maintain large software systems in a reliable and cost effective way; develops skills and understanding that function as the basis for many of the more advanced analysis and design practices encountered in the industry; topics include: systems development process, stakeholders and their roles, systems development project needs, software process methodologies, spiral and RUP, software analysis and requirement discovery, data modelling, SAD and OOAD, UML, use case diagrams, software project management, project scope, network diagrams and CPM, agile methodologies, XP, Scrum and FDD, class diagrams, realization of use cases, object-oriented design, sequence diagrams, activity diagrams, state transition diagrams, user interface design, software testing, software construction and maintenance.

CE 373: Database Systems

Credit Hours: 3+1
Fulfils: CE Algorithms and Software

Explores in detail the theoretical and practical aspects of Relational Database Management Systems (RDBMS); develops an understanding of database modeling, relational algebra, structured query language (SQL), components of Database Management System (DBMS), transaction management and concurrency control, database fine-tuning via indexing and partitioning, and database connectivity with front-end applications; discusses administrative aspects of database systems including database security, database management vs data warehousing vs data mining, and big data and its challenges.

CE/EE 391: Engineering Design and Innovation

Credit Hours: 0+2
Fulfils: CE Design

This course aims to cultivate skills needed to produce great designs, be a more effective engineer, and communicate with high emotional and intellectual impact. This is accomplished by working on projects centered around a locally contextualized wicked problem and students are expected to develop a solution to their identified problem by the end of semester. During the course of the semester, students will study and apply techniques suited for various steps of the design process. Students will come to appreciate that a design problem involves multiple stakeholders, come to terms with the ambiguity that shows up in design problems, make decisions in presence of multiple conflicting objectives and constraints, handle uncertainty, think as part of a team, learn how to manage the progress of their project, and communicate their design effectively.

CE/EE 491: Capstone Project I

Credit Hours: 3
Fulfils: Design in Engineering, Design Project

By the senior year, students have acquired sufficient breadth in Electrical Engineering (EE) and are on their way to acquire depth in one or more areas of specialization through technical electives. Intellectual maturity also requires that students understand their education in the broader context of the world and are prepared to make committed choices as participants of this complex world. The capstone design project, offered as a two semesters sequence, provides students with an opportunity to reflect on their entire educational experience, integrate the knowledge and skills acquired in earlier years, form connections within and across disciplines, and synthesize a solution to a problem connecting them to the broader issues of their discipline as well as the world they're about to enter.

CE/EE 492: Capstone Project II

Credit Hours: 3
Fulfils: Design in Engineering, Design Project

This year-long sequence represents the culmination of study towards the BS degree. Students work individually or in small teams on a project in which they utilize the knowledge acquired during the first three years of education. Each project is closely supervised by a faculty member and each team produces a comprehensive report at the end of the project.

CS 113: Discrete Mathematics
Credit Hours: 3+0
Prerequisite: None
Fulfils: CS Foundation; Formal Reasoning

Equips students with essential mathematical tools that will be encountered in future Computer Science courses; develops a capacity for formal mathematical manipulation and abstract thought; topics include: propositional logic, predicate and quantifiers, sets, functions, sequences, summations, relations, partial orderings, proofs, mathematical induction, pigeonhole principle, permutations and combinations, graphs, graph isomorphism, Euler and Hamiltonian paths, and trees.

ENGR 291: Engineering Workshop and Design
Credit Hours: 0+1
Fulfils: CE Design, EE Design ECE Minor Foundation

This course aims to introduce students to hands-on engineering skills, necessary for creating their own prototypes. Topics covered in this course include introduction to engineering design process, shop safety, engineering drawing, solid modeling (CAD), 3D printing, effective use of basic hand tools such as saws and files, machining (Lathe, Milling, Drill press), CNC machining, soldering techniques, and PCB design and printing. The course work emphasizes practical skills through lab activities and project. Students will be required to work with different materials including metal, wood, and plastic.

MATH 101: Calculus I
Credit Hours: 4
Fulfils: CE Engineering Sciences and Computing.
Prerequisite: None

The course covers important pre-requisite content related to functions, their behavior, and multiple contexts for which they serve as an important modelling tool. This course fulfills a foundational mathematics course requirement for the Electrical Engineering, Computer Engineering and Computer Science majors. It is also a mandatory requirement for all non-DSSE students wishing to pursue a Mathematics Minor.

MATH 102: Calculus II
Credit Hours: 3
Fulfils: CE Engineering Sciences and Computing.
Prerequisite: MATH 101

Calculus is a very important part of Applied Mathematics which in turn serves as an important tool in Science and Engineering. In Calculus I you studied the fundamental concepts of function and the techniques of differentiation and integration. Calculus II builds upon the concepts of calculus learned in the previous course and extends them to other areas of Applied Mathematics such as multivariable functions and vectors.

MATH 205: Linear Algebra
Credit Hours: 3
Fulfils: CE Engineering Sciences and Computing
Prerequisite: MATH 202

Topics covered: A brief revision of vector algebra including lines and planes in 3D and matrices, Determinants, Symmetric matrices, and quadratic forms; Elementary row and column operations of a matrix; Systems of linear equations and their solutions, existence, and uniqueness of solutions; Vector

spaces; Inner products and ortho-normalization; Orthogonal transformations and rotations; Linear transformations, orthogonality, QR factorization, Hermitian and Unitary transformations; Least squares analysis and approximations; Singular value decomposition; Direct sum decomposition; and Caley-Hamilton Theorem.

Natural Science Elective

Students pursuing a CE major are required to complete 01 Natural Science course, with or without lab component.

PLAY 113: Design Your Habib Experience

Credit Hours: 0+1
Fulfils: CE Design
Prerequisite: None

This course will take you through the basics of Human-Centered Design: an approach to problem-solving that involves empathizing with people; defining problems; generating ideas; prototyping solutions; and testing to learn what works and what doesn't. The first twelve weeks of the course will take students through the design process, practically applying key methods and mindsets to tackle problems around us at Habib. For example, this could be redesigning the university food experience, or designing a new student governance model. In the last three weeks of the course, students will apply their skills and knowledge to a more personal challenge: designing their own Habib experience.

Professional Practices Category Courses:

The students are required to enroll in either one of the following courses falling under the Professional Practices category:

MGMT 301: Technology Management and Entrepreneurship

Course Prerequisites: None
Credit hours: 2+0

Topics include: managing technological transitions, intellectual property, creating and managing an innovative organization, managing research and development, organizational learning, economist and sociologist views of entrepreneurship, the process and management of entrepreneurship, the importance of innovation, teamwork, financial and marketing aspects, product quality; study will be supplemented with case studies.

MGMT 304: Fundamentals of Intellectual Property

Course Prerequisites: None
Credit hours: 3+0

A primary purpose of this course is to raise awareness of Intellectual Property (IP) amongst students and to introduce the topic of IP, associated law, and some of its primary branches, to a non-legal (e.g. STEM, social sciences, design, liberal arts) audience so that they may effectively navigate through the landscape of various intellectual property regimes and related family of (legal) rights (IPR). Whilst these rights are rooted in law, intellectual property education has branches which touch many areas of academic research and commercial activity, including: economics, finance, taxation, human rights, ethics, education, governance and management. Studying intellectual property in a non-law curriculum can be seen as an 'opportunity' to engage with a vital topic that links commercial, legal and technical disciplines. Another important purpose of this course is to introduce students to the increasingly important area of IP management (and IP strategy). IP and intangible assets are driven by investments in R&D, advertising and marketing, education and training, management information systems, organizational structure, and so on. The development of such assets can involve invention or some other creative step, as well as innovation. The investments and the activities involved are all inherently risky. Thus, understanding the management of IP and intangible assets requires inputs from a variety of disciplines, including economics, law, accounting and finance, management, and so on. An exposure to some key tactics on the strategic management of IP supplemented

with relevant IP management case studies can be of immense value in todays and tomorrow's expanding ecosystem.

MGMT 320: Principles of Management

Course Prerequisites: None
Credit Hours: 3+0

The course on Principles of Management for Tech Professionals introduces management as a discipline and process to tech professionals. This course includes evolution and scope of management, decision-making, planning, strategy, organizing, staffing, leading, control, change, and the importance of management in the global environment and ethical considerations of management decisions. Hence, the course provides a framework that will enhance a person's effectiveness in the business.

MGMT 321: Engineering Project Management

Course Prerequisites: None
Credit Hours: 3+0

Through using textbook, discussions, assignments and real-world examples, the engineering professionals will learn how to identify, define, plan, execute, monitor, control, and close projects. They will build project components, organize work efficiently, effectively and help them to control changes. The students will use tools to build works schedules, allocate resources and manage cost of any project. This will help them to get a hands-on training of using project management tools for the smooth flow of various stages of project that is the need of time and most demanded skill by the employers all around the world.

MGMT 322: Operations Management

Course Prerequisites: None
Credit Hours: 3+0

The course aims to provide an understanding to identify, define, plan, execute, monitor, control, optimize and improve operations and processes in both manufacturing and service industries. For many different types of operations either in the tangible goods industry or the intangible service industry, this course aims to familiarize students with the major operational issues that challenge entrepreneurs and managers and provide them with the basic language, concepts, insights, and analytical tools to deal with these issues.

MGMT 323: Supply Chain Management

Course Prerequisites: None
Credit Hours: 3+0

The course aims to provide an understanding of fundamental concepts of supply chain management. All functional areas of supply chain management are explored in an integrated view of procurement, manufacturing and operations management, transportation and logistics, inventory and warehousing, demand planning, scheduling, network design, collaboration, and performance measurement. Topics may also cover supply chain financial metrics, strategy, and risk management for demand-driven value networks.

ECON 302: Engineering Economics

Credit Hours: 3+0
Fulfils: Professional Practice

Topics include: Application of economic principles to engineering solutions, time value of money, cash flow analysis, quantization of profitability, methods of evaluating investments, comparison of alternative investments, inflation, depreciation, resource depletion, economic analysis of projects, economic management of engineering projects.

LIST OF ELECTIVES:

Below is the proposed list of elective courses offered by the EE Major. These elective courses may be subject to change.

Fall 2022

EE 355/CE 362/MATH 322 – Statistics and Inferencing

EE 424 – Data Communication and Networking

EE 424L – Data Communication and Networking Lab

EE 433 – Power Electronics System Design

EE 451 – Digital Image Processing

EE 451L – Digital Image Processing Lab

EE 468 – Mobile Robotics

MGMT 320 – Principles of Management

MGMT 323 – Supply Chain Management

GRADUATING REQUIREMENTS:

1. Minimum credit hours: 130.

2. 33 required courses as specified in the grid for class of 2025.

3. One Natural Science course of at least 3 credit hours.

4. Two Professional Practice courses, totaling to at least 5 credit hours.

5. Two Multidisciplinary Engineering electives of at least 3 credit hours, each.

6. One Philosophy elective of at least 3 credit hours.

7. Four CE elective courses of 3 or 4 credit hours each. All electives are to be taken with their accompanying labs

Elective courses in any category are to be taken from the list approved by the ECE program

4-YEAR GRIDS:

CE Curriculum for Class of 2026 (Fall 22 - Spring 26) - v3.4
Graduation requirement: 44 courses & a minimum of 134 credit hours

Semester and CH	University Core — Code	Course Title	Th	Lb	Natural Science and Math — Code	Course Title	Th	Lb	Computing — Code	Course Title	Th	Lb	Electrical Engineering — Code	Course Title	Th	Lb
SEM-1 Fall 22 CH - 16 (Year 1 : 35 CH)	CORE 101	Rhetoric and Communication	4	0	MATH 101	Calculus I	4	0	CS 101	Programming Fundamentals	2	1	CE 100	Introduction to Electrical and Computer Engineering	0	2
	1. Language & Expression -1 of 2								2. Formal Reasoning - 1of1				CE 112	Electric Circuits -I	2	0
													PLAY 113	Design Your HU Experience	0	1
SEM-2 Spring 23 CH - 19	CORE 102	What is Modernity?	4	0	MATH 102	Calculus II	3	0	CE 171	Data Structures and Algorithms	3	1	CE 222	Digital Logic Design	3	1
	3. Historical & Social Thought - 1of2								CS 113	Discrete Math	3	0	ENGR 291	Engineering Workshop and Design	0	1
SEM-3 Fall 23 CH - 18-19 (Year 2 : 36-37 CH)	CORE 201	Pakistan and Modern South Asia	4	0	CE 361	Probability and Statistics	3	0	CE 272	Object Oriented Programming	3	1	CE 321	Computer Architecture	3	1
	4. Historical & Social Thought - 2of2				5. Quantitative Reasoning - 1 of 1											
					XX XXX	Natural Science Elective	3	0-1								
SEM-4 Spring 24 CH - 18	CORE 202	Hikmah I	3	0	MATH 205	Linear Algebra	3	0					CE 211	Basic Electronics	3	1
	6. Philosophical Thought - 1 of 2												CE 251	Signals and Systems	3	1
	CORE 200	Scientific Method	3	0									CE 332	Microcontrollers and Interfacing	0	1
	7. NS Method & Analysis - 1of1															
SEM-5 Fall 24 CH - 18 (Year 3 : 34-36 CH)	CORE 121	Jehan-e-Urdu	3	0	CE 362	Statistics and Inferencing	3	0	CE 324	Operating Systems	3	1	CE 341	Data Communication and Networking	3	1
	8. Language & Expression - 2 of 2								CE 373	Databases	3	1				
SEM-6 Spring 25 CH - 16-18									CE 374	Software Engineering	3	0	CE 301	ECE Seminar	1	0
													CE 352	Digital Signal Processing	3	1
													CE 391	Engineering Design and Innovation	0	2
													9. Creative Practice - 1of1			
													CE XXX	CE Elective I*	3	0-1
													XX XXX	Multidisciplinary Engineering Elective I*	3	0-1
SEM-7 Fall 25 CH - 14-17 (Year 4 : 29-34 CH)									ECON/MGMT xxx	Professional Practice Elective -I	2-3	0	CE 325	Digital Systems Design	3	0
													CE 491	Capstone Design Project -I	0	3
													CE XXX	CE Elective II*	3	0-1
													XX XXX	Multidisciplinary Engineering Elective II*	3	0-1
SEM-8 Spring 26 CH - 15-17	PHIL xxx	Philosophy Elective	3	0					ECON/MGMT xxx	Professional Practice Elective II	3	0	CE XXX	CE Elective III*	3	0-1
	10. Philosophical Thought - 2 of 2												CE XXX	CE Elective IV*	3	0-1
													CE 492	Capstone Design Project -II	0	3

Total Credit Hours	134	142
Non Engineering Credits	46	48
Engineering Credits	88	94
Worst-case ratio of non-engineering credits		35%

SEM	Semester
CH	Credit Hours
Th	Theory
Lb	Lab
C	Course Count

Legend
- University Core
- Engineering Sciences & Computing
- CE Foundations
- Networking and Security
- Computing Systems Design
- Algorithms and Software
- Information Systems
- Electronics
- Design

* Electives can be with or without labs - however, if the elective is offered with labs than those labs would be mandatory for graduation.