



Habib University
shaping futures

BS IN COMPUTER SCIENCE

4-YEAR ACADEMIC JOURNEY

Requirements for the Major

A major in BS Computer Science requires completion of (40) courses and a minimum of 130 credit-hours of coursework, with a minimum CGPA of 2.33, as shown in the table below:

Requirements	Course Category	Number of Courses to Complete
Habib Liberal Core ¹	University Core	10 ¹
CS Requirement (4 courses + 1 field Practice ²)	Design Your Habib Experience	1
	Digital Logic and Design	1
	Kaavish I (Capstone 1)	1
	Kaavish II (Capstone 2)	1
	Khidmat (Field Practice)	Non-credit component ²
Foundation courses ³ (3 courses)	Algorithmic Problem Solving	1 ¹
	Data Structures and Algorithm	1
	Discrete Mathematics	1
Kernel courses ³ (9 courses)	Design Your Habib Experience	1
	Object Oriented Programming	1
	Data Structures II	1
	System course	1
	Nature of computing	1
	Operating systems	1
	Artificial Intelligence	1
	Algorithms: Design and Analysis	1
	Software Engineering	1 ¹
CS Electives	Electives	5
Natural Science	Natural Science Elective	2
Mathematics	Required Math courses	5 ¹
Professional Practices	Professional Practice Elective	1
Free Electives	Free Electives	4 ⁴
Over All		40 (minimum)

¹ Three courses double counted in Habib Liberal core as well as one each in Mathematics, CS Foundation, and CS Kernel courses.

² A Khidmat module is an additional CS requirement that is to be ideally taken in summer 2 or 3. Khimidat aims for students to engage in society and make meaningful contributions to it in a manner that utilizes their computer science skills. Students engage in fieldwork immersing themselves in an environment that exposes them to real life challenges/issues occurring in society and make a positive impact.

³ Students must obtain a minimum grade of C+ in each CS Foundation and Kernel course.

⁴ The number of free electives attempted must be such that the total number of credit-hours is at least 130. Any course offered at the university, including CS electives, can be counted as a free elective. The quantity of the free electives shown above is for guidance only.

4-Year Academic Journey

The students of CS Major are required to complete a minimum of 40 courses and 130 credit-hours over their 4-year journey (8 semesters). A set of recommended courses (semester-wise) fall under the following course categories:

Category 1: Habib Liberal Core (HLC), also known as the University Core, is a common curriculum designed for all Habib University students as a mandatory requirement. A total of 10 courses are included in the HLC/University Core.

Category 2: Mathematics Requirement. Each student has to complete a total of 05 courses under the Mathematics Requirement category.

Category 3: Natural Science Elective. Each student has to complete a total of 02 courses under the NS Elective category.

Category 4: CS Requirement. Each student has to complete a total of 04 courses under the CS Requirement category.

Category 5: CS Foundation. Each student has to complete a total of 03 courses under the CS Foundation category.

Category 6: CS Kernel. Each student has to complete a total of 09 courses under the CS Kernel category.

Category 7: CS Electives. Each student has to complete 05 courses under the CS Electives category.

Category 8: Professional Practices. Each student has to complete 01 course under the Professional Practices category.

Category 9: Free Electives. The number of free electives attempted must be such that the total number of credit hours is at least 130.

Courses to complete	Credit hours	Course Category	Comments
First Semester (5/6 Courses)			
CORE 101 – Rhetoric and Communication	4	University Core (1 of 10)	
MATH 101 – Calculus I	3	Mathematics Requirement (1 of 5)	
Natural Science Elective	3-1	Natural Science Elective (1 of 2)	Amongst the 2 NS electives (in 1st and 2nd semester), one of them (preferably in 1st semester) must be taken with a lab.
CS 101 – Algorithmic Problem Solving	3-1	CS Foundation (1 of 3) and University Core (2 of 10)	Double-counted towards CS Foundation as well as Habib Liberal Core.
PLAY 113 – Design Your Habib Experience	0-1	CS Requirement (1 of 4)	The course can only be taken either in the 1st or 2nd semester.

Courses to complete	Credit hours	Course Category	Comments
Second Semester (5/6 Courses)			
CORE 102 – What is Modernity	4	University Core (3 of 10)	
MATH 102 – Calculus II	3	Mathematics Requirement (2 of 5)	
Natural Science Elective	3-0/1	Natural Science Elective (2 of 2)	Amongst the 2 NS electives (in 1st and 2nd semester), one of them (preferably in 1st semester) must be taken with a lab.
CS 113 – Discrete Mathematics	3	CS Foundation (2 of 3)	
CS 102 – Data Structures & Algorithms	3-1	CS Foundation (3 of 3)	
PLAY 113 – Design Your Habib Experience	0-1	CS Requirement (1 of 4)	The course can only be taken either in the 1st or 2nd semester.
Third Semester (5 Courses)			
CORE 201 – Pakistan and Modern South Asia	4	University Core (4 of 10)	
MATH 202 – Engineering Mathematics	3	Mathematics Requirement (3 of 5)	
CS 130 – Digital Logic and Design	3-1	CS Requirement (2 of 4)	This course is also offered with the code EE 172 and CE 222.
CS 355 – Database Systems	3-1	CS Kernel (1 of 9)	
CS 224 – Object Oriented Programming	3-1	CS Kernel (2 of 9)	
Fourth Semester (5 Courses)			
CORE 202 – Hikma I	4	University Core (5 of 10)	
MATH 205 – Linear Algebra	3	Mathematics Requirement (4 of 5)	
MATH 310 – Probability and Statistics	3	Mathematics Requirement (5 of 5) and University Core (6 of 10)	The course is also offered with the code EE 354 and CE 361. It is double-counted towards Mathematics requirement as well as Habib Liberal Core (Quantitative Reasoning Form of Thought)
CS 201 – Data Structures II	3	CS Kernel (3 of 9)	
A course in CS Systems	3-1	CS Kernel (4 of 9)	Currently, CS 330 – Computer Architecture is being offered under CS Systems category.

Fifth Semester (5 Courses)			
CORE 200 – Scientific Methods	3	University Core (7 of 10)	
CORE 121 – Jehan-e-Urdu	4	University Core (8 of 10)	
CS 212 – Nature of Computation	3	CS Kernel (5 of 9)	
CS 232 – Operating Systems	3-1	CS Kernel (6 of 9)	
CS Elective*	3-0/1	CS Elective (1 of 5)	
Sixth Semester (5 Courses)			
A course in Philosophical Form of Thought	3/4	University Core (9 of 10)	
CS 351 – Artificial Intelligence	3	CS Kernel (7 of 9)	
CS 353 – Software Engineering	3	University Core (10 of 10) and CS Kernel (8 of 9)	Double-counted towards CS Kernel as well as Habib Liberal Core (Creative Practice Form of Thought)
CS 412 – Algorithms: Design and Analysis	3	CS Kernel (9 of 9)	
CS Elective*	3-0/1	CS Elective (2 of 5)	
Seventh Semester (6 Courses)			
CS 491 – Kaavish I	0-3	CS Requirement (3 of 4)	
CS Elective* (02 courses)	3-0/1	CS Elective (3 & 4 of 5)	
Professional Practices	3	Professional Practices (1 of 1)	
Free Elective** (03 courses)	3-0/1	Free Elective (1 & 2 of 4)	
Eighth Semester (4 Courses)			
CS 492 – Kaavish II	0-3	CS Requirement (4 of 4)	
CS Elective*	3-0/1	CS Elective (5 of 5)	
Free Elective** (02 courses)	3-0/1	Free Elective (3 & 4 of 4)	

Note 1: *CS Electives with lab (3+1) will be counted as one complete course. The student has to pass both theory and lab section for these.

**The number of free electives attempted must be such that the total number of credit hours is at least 130. Any course offered at the university, including CS electives, can be counted as a free elective. The quantity and semester placement of the free electives shown above is for guidance only.

Note 2: Students must obtain a minimum grade of C+ in each CS Foundation and Kernel course. However, university policy for CS 101 – Programming Fundamentals course (taken in 1st semester), will be followed.

Note 3: A Khidmat module is an additional CS requirement that is to be ideally taken in summer 2 or 3. Khidmat aims for students to engage in society and make meaningful contributions to it in a manner that utilizes their computer science skills. Students engage in fieldwork immersing themselves in an environment that exposes them to real life challenges/issues occurring in society and make a positive impact.

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