

BS Information Technology Revised Curriculum 2023

* This document is revised as per NCEAC curriculum 2023.

This document is revised as per NCEAC revised curriculum w.e.f. Fall-23.

Generic Structure for Computing Disciplines:

Areas	Credit Hours	Courses
Computing Core	46	14*
Domain Core	18	06
Domain Elective	21	07
Mathematics & Supporting Courses	12	04
Elective Supporting Courses	03	01
General Education Requirement [GE]	30	12
Mandatory Internship	03**	01
Totals	133	45

* FYP is offered in place of Capstone Project having 3 Credit Hours. FYP is composed of 6 Credit Hours and divided in 3 semesters rather 2 semesters.

** 3 Credit Hours Internship course is offered in summer semester (8 Weeks)

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Program Structure for BS Information Technology Program as per revised NCEAC-23 Criteria

Core Computing/14 courses				
Sr. #	Course Code	Course Title	Pre-Req	Cr. Hrs.
1.	CS111	Programming Fundamentals	-	3-0-3 ✓
	CS111L	Programming Fundamentals Lab	-	0-1-1 ✓
2	CS112	Object Oriented Programming	CS111 CS111L	3-0-3 ✓
	CS112L	Object Oriented Programming Lab	CS111 CS111L	0-1-1 ✓
3.	EE123	Digital Logic Design	-	2-0-2 ✓
	EE123L	Digital Logic Design Lab	-	0-1-1 ✓
4.	CS130	Database Systems		3-0-3 ✓
	CS130L	Database Systems Lab		0-1-1 ✓
5.	CS216	Data Structures	CS112 CS112L	3-0-3 ✓
	CS216L	Data Structures Lab	CS112 CS112L	0-1-1 ✓
6.	CS215	Information Security	-	2-0-2 ✓
	CS215L	Information Security Lab	-	0-1-1 ✓
7.	CS260	Computer Networks		2-0-2 ✓
	CS260L	Computer Networks Lab		0-1-1 ✓
8	CS226	Computer Organization and Assembly Language	EE 123 EE123L	2-0-2 ✓

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	CS226L	Computer Organization and Assembly Language Lab	EE 123, EE123L	0-1-1
9	CS325	Operating Systems		2-0-2 ✓
	CS325L	Operating Systems Lab		0-1-1 ✓
10	CS332	Design and Analysis of Algorithms	CS216 CS216L	3-0-3 ✓
11	CS344	Artificial Intelligence		2-0-2 ✓
	CS344L	Artificial Intelligence Lab		0-1-1 ✓
12	CS 305	Software Engineering	-	3-0-3 ✓
13	IT497	Final Year Project – I	List A	0-1-1
14	IT498	Final Year Project – II	IT497	0-2-2
	IT499	Final Year Project – III	IT498	0-3-3
				46
Domain Core/06 courses				
1	IT271	Web Technologies		2-0-2
2	IT374	Cyber Security		2-0-2
	IT374 L	Cyber Security Lab		0-1-1
3	CS426	Parallel and Distributed Computing	CS325 CS325L	2-0-2
	CS426L	Parallel and Distributed Computing Lab	CS325 CS325L	0-1-1
4	IT433	DB Administration and Management	IT433	2-0-2
	IT433L	DB Administration and Management	IT433L	0-1-1
5	IT364	Systems and Network Administration		2-0-2
	IT364L	Systems and Network Administration Lab		0-1-1
6	IT223	Information Technology Infrastructure		2-0-2

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	IT223L	Information Technology Infrastructure Lab		0-1-1
				18
Domain Electives (07 Courses)				
Sr. #	Course Code	Course Title	Pre-req	Cr. Hrs.
1	CS281	Mobile Application Development		2-0-2
	CS281L	Mobile Application Development Lab		0-1-1
2	CS301	Full stack web development	CS112 CS112L	2-0-2
	CS301L	Full stack web development Lab	CS112 CS112L	0-1-1
3	IT352	Virtual Systems & Services		2-0-2
	IT352L	Virtual Systems & Services Lab		0-1-1
4	IT410	Digital Marketing		2-0-2
	IT410	Digital Marketing Lab		0-1-1
5	IT 323	Big Data Analytics		2-0-2
	IT 323L	Big Data Analytics Lab		0-1-1
6	IT433	Visual Programming	CS112 CS112L	2-0-2
	IT433L	Visual Programming Lab	CS112 CS112L	0-1-1
7	IT 454	DevOps		2-0-2
	IT 454L	DevOps Lab		0-1-1
				21
Mathematics and Supporting Courses (04 Courses)				
1	MA 105	Multivariable Calculus	-	3-0-3
2	MA 201	Linear Algebra		3-0-3

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3	MA 301	Probability and Statistics		3-0-3
4	EL 400	Technical and Business Writing		3-0-3
				12
Elective Supporting Courses (01 Course)				
1	MK101	Principles of Marketing		3-0-3
General Education Requirement as per HEC Education policy (12 Courses)				
1	CS 181	Application of Information and Communication Technologies	-	2-0-2
	CS 181L	Application of Information and Communication Technologies Lab	-	0-1-1
2	EL 170	Functional English	-	3-0-3
3	EL 271	Expository Writing	EL 170	3-0-3
4	MA 216	Discrete Structures	-	3-0-3
5	MA110	Calculus and Analytic Geometry	-	3-0-3
6	HU124	Islamic Studies & Ethics	-	2-0-2
7	HU405	Ideology and Constitution of Pakistan	-	2-0-2
8	BA152	Introduction to Management	-	2-0-2
9	PH111	Applied Physics	-	2-0-2
	PH111L	Applied Physics Lab	-	0-1-1
10	CS470	Professional Practices	-	2-0-2
11	HU411	Civics and Community Engagement	-	2-0-2
12	BA353	Entrepreneurship	-	2-0-2
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BS Information Technology Applicable from Fall-2023 Intake & Onwards

Semester-1:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req.
EL170	Functional English	3-0-3	
HU124	Islamic Studies & Ethics	2-0-2	
PH111	Applied Physics	2-0-2	
PH111L	Applied Physics Lab	0-1-1	
CS181	Application of Information and Communication Technologies	2-0-2	
CS181L	Application of Information and Communication Technologies Lab	0-1-1	
CS111	Programming Fundamentals	3-0-3	
CS111L	Programming Fundamentals Lab	0-1-1	
MA114	*Foundational Mathematics(no-credit)	3-0-3	
	Total	12-3-15	
	Total Contact Hours=21		

*for pre-medical students only.

Semester-2:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req.
EL271	Expository Writing	3-0-3	EL170
CS215	Information Security	2-0-2	
CS215L	Information Security Lab	0-1-1	
CS112	Object Oriented Programming	3-0-3	CS 111, CS111L
CS112L	Object Oriented Programming Lab	0-1-1	CS 111, CS111L
MA216	Discrete Structures	3-0-3	
EE123	Digital Logic Design	2-0-2	
EE123L	Digital Logic Design Lab	0-1-1	
MA118	Pre-Calculus (Non-Credit)*	3-0-3	
	Total	13-3-16	
	Total Contact Hours=22		

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Semester-3:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req.
CS216	Data Structures	3-0-3	CS112, CS112L
CS216L	Data Structures Lab	0-1-1	CS112, CS112L
IT271	Web Technologies	2-0-2	
IT271L	Web Technologies Lab	0-1-1	
CS305	Software Engineering	3-0-3	
MA110	Calculus and Analytical Geometry	3-0-3	
CS260	Computer Networks	2-0-2	
CS260L	Computer Networks Lab	0-1-1	
HU405	Ideology and Constitution of Pakistan	2-0-2	
	Total	15-3-18	
	Total Contact Hours=22		

Semester-4:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req.
CS130	Database Systems	3-0-3	CS 214, CS214L
CS130L	Database Systems Lab	0-1-1	CS 214, CS214L
IT223	Information Technology Infrastructure	2-0-2	
IT223L	Information Technology Infrastructure Lab	0-1-1	
CS325	Operating Systems	2-0-2	
CS325L	Operating Systems Lab	0-1-1	
HU400	Technical & Business Writing	3-0-3	
MA105	Multivariable Calculus	3-0-3	MA110
	Total	13-3-16	
	Total Contact Hours=22		

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SEMESTER-SUMMER*

Sr. #	Course Code	Course Title	Pre-Req	Cr. Hrs.
1.	IT490	Internship		3-0-3

* Students can apply for 6-8 weeks supervised internship course

Semester-5:

Course Code	Course	Cr. Credit Hrs (Theory – Lab – Total)	Pre-Req.
ITXXX	Domain Elective-I	2-0-2	
CSXXXL	Domain Elective-I Lab	0-1-1	
IT364	Systems and Network Administration	2-0-2	
IT364L	Systems and Network Administration Lab	0-1-1	
CS226	Computer Organization and Assembly Language	2-0-2	EE123, EE123L
CS226L	Computer Organization and Assembly Language Lab	0-1-1	EE123, EE123L
MA201	Linear Algebra	3-0-3	
ITXXX	Domain Elective-II	2-0-2	
ITXXXL	Domain Elective-II Lab	0-1-1	
BA152	Introduction to Management	2-0-2	
	Total	13-4-17	
	Total Contact Hours=25		

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Semester-6:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req.
IT374	Cyber Security	2-0-2	
IT374 L	Cyber Security Lab	0-1-1	
BAXXX	Elective Supporting	3-0-3	
CS344	Artificial Intelligence	2-0-2	
CS344L	Artificial Intelligence-Lab	0-1-1	
CS332	Design and Analysis of Algorithms	3-0-3	CS216, CS216L
ITXXX	Domain Elective-III	2-0-2	
ITXXXL	Domain Elective-III Lab	0-1-1	
IT497	Final Year Project-I	0-1-1	List A
	Total	12-4-16	
	Total Contact Hours=21 *FYP 01		

List A (Pre-requisites for FYP-I registration)

S#	Course Code	Course Title	Credit Hours
1.	CS111	Programming Fundamentals	3-0-3
	CS111L	Programming Fundamentals Lab	0-1-1
2.	CS112	Object Oriented Programming	3-0-3
	CS112L	Object Oriented Programming Lab	0-1-1
3.	CS216	Data Structures	3-0-3
	CS216L	Data Structures Lab	0-1-1
4.	CS130	Database Systems	3-0-3
	CS130L	Database Systems Lab	0-1-1
5.	CS305	Software Engineering	3-0-3
6.	CS325	Operating Systems	3-0-3
	CS325L	Operating Systems Lab	0-1-1

SEMESTER-SUMMER*

Sr. #	Course Code	Course Title	Pre-Req	Cr. Hrs.
1.	IT490	Internship		3-0-3

* Student who did not avail internship must apply for 6-8 weeks supervised internship course

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Semester-7:

Course Code	Course	Credit Hrs (Theory – Lab – Total)	Pre-Req
IT433	DB Administration and Management	2-0-2	
IT433L	DB Administration and Management	0-1-1	
MA301	Probability and Statistics	3-0-3	
BA353	Entrepreneurship	2-0-2	
IT4XX	Domain Elective-IV	2-0-2	
IT4XX	Domain Elective-IV Lab	0-1-1	
CS470	Professional Practices	2-0-2	
IT4XX	Domain Elective-V	2-0-2	
IT4XX	Domain Elective-V Lab	0-1-1	
IT498	Final Year Project II	0-2-2	IT497
	Total	13-5-18	
	Total Contact Hours=22 *FYP 02		

Semester-8:

Course Code	Course	Cr. Hrs. Credit Hrs (Theory – Lab – Total)	Pre-Req
IT4XX	Domain Elective-VI	2-0-2	
IT4XX	Domain Elective-VI Lab	0-1-1	
ITXXX	Domain Elective-VII	2-0-2	
ITXXXL	Domain Elective-VII Lab	0-1-1	
HU411	Civic and Community Engagement	2-0-2	
CS426	Parallel and Distributed Computing	2-0-2	CS325 CS325L
CS426L	Parallel and Distributed Computing Lab	0-1-1	CS325 CS325L
IT499	Final Year Project-III	0-3-3	IT498
	Total	8-6-14	
	Total Contact Hours=17 , *FYP 03		
	Grand Total	133	

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List of Elective Course

Sr. #	Course Code	Course Title	Pre-req	Cr. Hrs.
1	CS281	Mobile Application Development		2-0-2
	CS281L	Mobile Application Development Lab		0-1-1
2	CS301	Full stack web development	CS112 CS112L	2-0-2
	CS301L	Full stack web development Lab	CS112 CS112L	0-1-1
3	IT352	Virtual Systems & Services (Domain elective-III)		2-0-2
	IT352L	Virtual Systems & Services Lab (Domain elective-III)		0-1-1
4	IT410	Digital Marketing (Domain Elective-VII)		2-0-2
	IT410	Digital Marketing Lab (Domain Elective)		0-1-1
5	IT 323	Big Data Analytics		2-0-2
	IT 323L	Big Data Analytics Lab		0-1-1
6	IT 433	Visual Programming	CS112 CS112L	2-0-2
	IT 433L	Visual Programming Lab	CS112 CS112L	0-1-1
7	IT 454	DevOps		2-0-2
	IT 454L	DevOps Lab		0-1-1
8		Natural Language Processing		2-0-2
		Natural Language Processing Lab		0-1-1
9		Computer Vision		2-0-2
		Computer Vision Lab		0-1-1
10		Data Mining		2-0-2
		Data Mining Lab		0-1-1
11		Fundamentals of Quantum Communication		2-0-2
		Fundamentals of Quantum Communication Lab		0-1-1
12		Deep Learning		2-0-2
		Deep Learning Lab		0-1-1
13		Distributed Databases		2-0-2
		Distributed Databases Lab		0-1-1
14		Digital Image Processing		2-0-2
		Digital Image Processing Lab		0-1-1
15		Machine Learning		2-0-2

* Codes

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		Machine Learning Lab		0-1-1
16		Block Chain		2-0-2
		Block Chain Lab		0-1-1
17		Quantum Computing		2-0-2
		Quantum Computing Lab		0-1-1
18		MLOps		2-0-2
		ML Ops Lab		0-1-1
19		Data Science		2-0-2
		Data Science Lab		0-1-1

*Elective courses can be added as per availability of faculty and market trends.

*Students may take two electives from other departments of FCAI.

* Course codes of SNO 8 - A will be finalized by HODCS.

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