BS (Hons)-CySec
[Bachelor of Studies (Honours) – Cyber Security]

ELIGIBILITY CRITERIA:

The candidate has passed the Intermediate or equivalent examination with Mathematics securing at least 50% marks in aggregate from an institution recognized by the Higher Education Commission of Pakistan / Inter Board Committee of Chairmen, Pakistan.

*Equivalency certificate by IBCC will be required in case of education from some other country or system.

• The students who have not studied Mathematics at intermediate level have to pass deficiency courses of Mathematics (06 credits) in first two semesters.

PROGRAM STRUCTURE:

(Program is equivalent to 16 years of education)

Minimum Duration: 4 years; through 8 regular semesters (Fall/Spring)

Minimum Credits: 132

STRUCTURE A- SINGLE MAJOR

The breakup of these 132 Credits is as follows:

Category	Credits	No. of Courses
General Education	39	13
Distribution Courses	39	13
Major	54	18
Internship	Non Credit (compulsory)	-
PLL	Non Credit (compulsory)	-

STRUCTURE B-ONE MAJOR + ONE MINOR

The breakup of these 132 Credits is as follows:

Category	Credits	No. of Courses
General Education	39	13
Distribution Courses	30	10
Major	51	17
Minor	12	4
Internship	Non Credit (compulsory)	-
PLL	Non Credit (compulsory)	-

STRUCTURE C- DOUBLE MAJOR

The breakup of these 132 Credits is as follows:

Category	Credits	No. of Courses
General Education	39	13
Distribution Courses	15	5
Major 1	39	13
Major 2	39	13
Internship	Non Credit (compulsory)	-
PLL	Non Credit (compulsory)	-

STRUCTURE D- SINGLE MAJOR + TWO MINOR

The breakup of these 132 Credits is as follows:

Category	Credits	No. of Courses
General Education	39	13
Distribution Courses	18	6
Major	45	15
Minor 1	15	5
Minor 2	15	5
Internship	Non Credit (compulsory)	-
PLL	Non Credit (compulsory)	-

STRUCTURE E- ASSOCIATE DEGREE (60 CREDIT HOURS)

The breakup of these 60 Credits is as follows:

Category	Credits	No. of Courses
General Education	39	13
Distribution Courses	6	2
Major	15	5

GENERAL EDUCATION - COMPULSORY COURSES *Total: 39 Credits*

Category	Courses	Code	Title of Course	Credits
Arts & Humanities	2	GENL151	1. Functional Urdu	2
		GENL252	2. Translation of Holy Quran (*for Muslim Students*) **OR**	4
		GENL253	Principles of Ethics (*for Non-Muslim Students*)	4
		GENL324	3. Sports and Exercise Physiology	3
		GENL434	4. Short Film and Drama Production	3
		GENL435	5. Cultural Heritage in Pakistan	3
Natural Sciences	2	GENL121	1. Environmental Sciences	3
		GENL122	2. Fundamentals of Applied Physics	3
		GENL123	3. Every Day Science	3
		GENL124	4. Geography and Natural Resources	3
		GENL125	5. Introduction to Ecology	3
Social Sciences	2	GENL101	1. Introduction to Political Science	3
		GENL102	2. Introduction to International Relations	3
		GENL103	3. Introduction to Sociology	3
		GENL131	4. Population Studies	3
		GENL132	5. Legal Systems of Pakistan	3
		GENL231	6. Gender Studies	3
Expository Writing	3	GENL161	1. Expository 1: Functional Composition & Comprehension	3

		GENL262	2. Expository II: Communication and Academic Writing	3
		GENL263	3. Exposition III: Technical writing & Presentation Skills	3
Quantitative Reasoning	2	GENL111	1. Elements of Statistics & Probability	3
		GENL112	2. General Mathematics	3
		GENL113	3. Introduction to Mathematical Reasoning	3
		GENL114	4. Introduction to Information and Communication Technology	3+1
		GENL115	5. Logic and Critical Thinking	3
Islamiyat / Moral Values	1	GENL141	1. Fundamentals of Islamic Studies (*For Muslim Students*) **OR**	3
		GENL142	Moral Values (*for Non-Muslim Students*)	3
Pakistan Studies	1	GENL143	Pakistan Studies	3

COURSES OF STUDY :

(*Information about the Prerequisites (if any) of the course(s) will be provided by the Department at the beginning of the program*)

COURSE FOR MAJORING IN CYBER SECURITY :

A. **Single Major in Cyber Security (without any Minor)**

Distribution courses for Single Major: *Total: (39 Credits)*

Subject to University offerings, the student shall opt 39 credits from the list below:

Course Code	Title of Course	Credits
MATH112	Discrete Structures for CSC	3
MATH113	Calculus and Analytical Geometry for CSC	3
MATH212	Linear Algebra for CSC	3
MATH233	Differential Equations	3
BUSS273	Professional Practices	3
CRSC121	Programming Fundamentals	4
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	4
CRSC242	Database Management Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC331	Computer Networks	3+1
CRSC422	Information Security	3

Major courses for Single Major: *Total: (42 Credits)*

Subject to University offerings, the student shall opt 42 credits from the list below:

Course Code	Title of Course	Credits
CRSC211	Digital Logic Design	4
CRSC223	Operating Systems	3
CRSC312	Artificial Intelligence	4
CRSC323	Design and Analysis of Algorithms	3
CRSC326	Computer Architecture and Assembly Language	4
CRSC434	Parallel and Distributed Computing	3
CRSC461	Introduction to Cyber Security	3
CRSC462	Digital Forensics	3
CRSC464	Secure Software Design and Development	3
CRSC465	Vulnerability Assessment & Reverse Engineering	3
CRSC467	Information Assurance	3
CRSC468	Network Security	3
CRSC487	Final Year Project in BS (CySec)	6

Electives Courses   *Total: (12 Credits)*

Subject to University offerings, the student shall opt four courses from the list below:

Course Code	Title of Course	Credits
CRSC111	Basic Electronics	3
CRSC212	Advance Digital Logic Design	3
CRSC325	Computer Architecture and Organization	3
CRSC463	Wireless and Mobile Security	3
CRSC466	Cyber Law	3
CRSC471	Hardware Security	3
CRSC472	Embedded Systems	3
CRSC473	Embedded Systems Security	3
CRSC474	Control System Security	3
CRSC475	Penetration Testing	3
CRSC476	Malware Analysis	3
CRSC477	Cryptanalysis	3
CRSC478	Cyber Warfare	3

B. Major in Cyber Security (alongside One Minor)

Distribution courses for Single Major and One Minor: Total: (30 credits)

Subject to University offerings, the student shall opt 30 credits from the list below:

Course Code	Title of Course	Credits
MATH112	Discrete Structures for CSC	3
MATH113	Calculus and Analytical Geometry for CSC	3
MATH212	Linear Algebra for CSC	3
MATH233	Differential Equations	3
BUSS273	Professional Practices	3
CRSC121	Programming Fundamentals	4
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	3
CRSC242	Database Management Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC331	Computer Networks	3+1
CRSC422	Information Security	3

Major courses for Single Major and One Minor: *Total: (42 Credits)*

Course Code	Title of Course	Credits
CRSC211	Digital Logic Design	4
CRSC223	Operating Systems	3
CRSC312	Artificial Intelligence	4
CRSC323	Design and Analysis of Algorithms	3
CRSC326	Computer Architecture and Assembly Language	4
CRSC434	Parallel and Distributed Computing	3
CRSC461	Introduction to Cyber Security	3
CRSC462	Digital Forensics	3
CRSC464	Secure Software Design and Development	3
CRSC465	Vulnerability Assessment & Reverse Engineering	3
CRSC467	Information Assurance	3
CRSC468	Network Security	3
CRSC487	Final Year Project in BS (CySec)	6

Electives Courses   *Total: 9 Credits*

Subject to University offerings, the student shall opt three courses from the list below:

Course Code	Title of Course	Credits
CRSC111	Basic Electronics	3
CRSC212	Advance Digital Logic Design	3
CRSC325	Computer Architecture and Organization	3
CRSC463	Wireless and Mobile Security	3
CRSC466	Cyber Law	3
CRSC471	Hardware Security	3

CRSC472	Embedded Systems	3
CRSC473	Embedded Systems Security	3
CRSC474	Control System Security	3
CRSC475	Penetration Testing	3
CRSC476	Malware Analysis	3
CRSC477	Cryptanalysis	3
CRSC478	Cyber Warfare	3

C. Double Major in Cyber Security (with Computer Science Major)

Distribution courses for Double Major: *Total: (15 Credits)*

Course Code	**Title of Course**	**Credits**
MATH112	Discrete Structures for CSC	3
MATH233	Differential Equations	3
MATH212	Linear Algebra for CSC	3
MATH113	Calculus and Analytical Geometry for CSC	3
BUSS273	Professional Practices	3

Major courses in Computer Science (alongside another Major in Cyber Security)
Total: (39 Credits)

Course Code	**Title of Course**	**Credits**
CRSC121	Programming Fundamentals	4
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	3
CRSC223	Operating Systems	3
CRSC242	Database Management Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC311	Theory of Automata	3
CRSC323	Design and Analysis of Algorithms	3
CRSC324	Compiler Construction	3
CRSC331	Computer Networks	3+1
CRSC343	Fundamentals of Graph Theory	3
CRSC344	Theory of Programming Languages	3
CRSC422	Information Security	3
CRSC482	Final Year Project	6

Major courses in Cyber Security (alongside another Major in CS)

Total: (39 Credits)

Subject to University offerings, the student shall opt 39 credits from the list below:

Course Code	Title of Course	Credits
CRSC211	Digital Logic Design	4
CRSC312	Artificial Intelligence	4
CRSC326	Computer Architecture and Assembly Language	4
CRSC434	Parallel and Distributed Computing	3
CRSC461	Introduction to Cyber Security	3
CRSC462	Digital Forensics	3
CRSC464	Secure Software Design and Development	3
CRSC465	Vulnerability Assessment & Reverse Engineering	3
CRSC467	Information Assurance	3
CRSC468	Network Security	3
CRSC487	Final Year Project in BS (CySec)	6

D. Major in Cyber Security (alongside two Minors)

Distribution courses for Single Major and Two Minors: *Total: (18 Credits)*

Subject to University offerings, the student shall opt 18 credits from the list below:

Course Code	Title of Course	Credits
MATH112	Discrete Structures for CSC	3
MATH113	Calculus and Analytical Geometry for CSC	3
MATH212	Linear Algebra for CSC	3
MATH233	Differential Equations	3
BUSS273	Professional Practices	3
CRSC223	Operating Systems	3
CRSC251	Introduction to Software Engineering	3
CRSC422	Information Security	3

Major courses for Cyber Security alongside Minor in CS and other Minor

Total: (45 Credits)

Subject to University offerings, the student shall opt 45 credits from the list below:

Course Code	Title of Course	Credits
CRSC211	Digital Logic Design	4
CRSC221	Object Oriented Programming	4
CRSC312	Artificial Intelligence	4
CRSC323	Design and Analysis of Algorithms	3
CRSC326	Computer Architecture and Assembly Language	4
CRSC434	Parallel and Distributed Computing	3
CRSC461	Introduction to Cyber Security	3
CRSC462	Digital Forensics	3
CRSC464	Secure Software Design and Development	3

CRSC465	Vulnerability Assessment & Reverse Engineering	3
CRSC467	Information Assurance	3
CRSC468	Network Security	3
CRSC487	Final Year Project in BS (CySec)	6

Minor in Computer Science (alongside Major in DS and Minor in another discipline)
Total: 5 courses

Course Code	Title of Course	Credits
CRSC121	Programming Fundamentals	4
CRSC222	Data Structure and Algorithms	4
CRSC242	Database Management Systems	4
CRSC225	Web Engineering	3
CRSC331	Computer Networks	3+1
MATH112	Discrete Structures for CSC	3
MATH113	Calculus and Analytical Geometry for CSC	3
MATH212	Linear Algebra for CSC	3
MATH233	Differential Equations	3
BUSS273	Professional Practices	3
CRSC223	Operating Systems	3
CRSC251	Introduction to Software Engineering	3
CRSC422	Information Security	3

Major courses for DS alongside Minor in CS and any other Minor
Total:(45 Credits)

Subject to University offerings, the student shall opt 45 credits from the list below:

Course Code	Title of Course	Credits
CRSC211	Digital Logic Design	4
CRSC221	Object Oriented Programming	4
CRSC312	Artificial Intelligence	4
CRSC323	Design and Analysis of Algorithms	3
CRSC326	Computer Architecture and Assembly Language	4
CRSC434	Parallel and Distributed Computing	3
STAT373	Advance Statistics	3
CRSC438	Introduction to Data Science	3
CRSC441	Data Mining	3
CRSC443	Data Warehousing and Business Intelligence	3
CRSC444	Data Visualization	3
CRSC445	Big Data Analytics	3
CRSC486	Final Year Project in BS (DS)	6

Minor in Computer Science (alongside Major in DS and Minor in another discipline)

Total: 5 courses

Course Code	Title of Course	Credits
CRSC121	Programming Fundamentals	4
CRSC222	Data Structure and Algorithms	3
CRSC242	Database Management Systems	4
CRSC225	Web Engineering	3
CRSC331	Computer Networks	3+1