

BS (Hons) -SE

[Bachelor of Studies (Honours) Software Engineering]

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

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 SOFTWARE ENGINEERING :

A) Single Major in Software Engineering (without any Minor) Total: 39 Credits

Course Code	Title of Course	Credits
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	4
CRSC223	Operating Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC354	Software Architecture and Design	3
CRSC455	Software Construction and Development	3
CRSC356	Software Project Management	3
CRSC454	Software Quality Engineering	3
CRSC456	Software Re-Engineering	3
CRSC482	Final Year Project for CSC	6

Electives Courses**Total: 15 Credits**

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

Course Code	Title of Course	Credits
CRSC232	Telecom Systems	3
CRSC273	Mobile Application Development	3
CRSC274	E-Commerce	3
CRSC301	Human Computer Interaction	3
CRSC312	Artificial Intelligence	3
CRSC332	Network Management	3
CRSC335	Internet Architecture and Protocols	3
CRSC336	Information Systems	3
CRSC341	Topics in Database Management Systems	3
CRSC345	Knowledge Based Systems	3
CRSC441	Data Mining	3
CRSC442	Data Warehousing	3
CRSC456	Principles of Cloud Computing	3

B) Major in Software Engineering (alongside One Minor) Total: 39 Credits

Course Code	Title of Course	Credits
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	4
CRSC223	Operating Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC354	Software Architecture and Design	3
CRSC455	Software Construction and Development	3
CRSC356	Software Project Management	3
CRSC454	Software Quality Engineering	3
CRSC456	Software Re-Engineering	3
CRSC482	Final Year Project for CSC	6

Electives Courses**Total: 12 Credits**

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

Course Code	Title of Course	Credits
CRSC232	Telecom Systems	3
CRSC273	Mobile Application Development	3
CRSC274	E-Commerce	3
CRSC301	Human Computer Interaction	3
CRSC312	Artificial Intelligence	3
CRSC332	Network Management	3
CRSC335	Internet Architecture and Protocols	3
CRSC336	Information Systems	3
CRSC341	Topics in Database Management Systems	3
CRSC345	Knowledge Based Systems	3
CRSC441	Data Mining	3
CRSC442	Data Warehousing	3
CRSC456	Principles of Cloud Computing	3

C) Major in Software Engineering (alongside another Major in CS or IT)**Total: 39 Credits**

Course Code	Title of Course	Credits
CRSC251	Introduction to Software Engineering	3
CRSC225	Web Engineering	3
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC354	Software Architecture and Design	3
CRSC455	Software Construction and Development	3
CRSC356	Software Project Management	3
CRSC452	Formal Methods in SE	3
CRSC454	Software Quality Engineering	3
CRSC456	Software Re-Engineering	3
CRSC342	Business Process Engineering	3
CRSC383	Stochastic Processes	3
CRSC453	Modeling and Simulation	3
CRSC382	Operations Research	3
CRSC381	Research Methodology for CSC	3
CRSC482	Final Year Project for CSC	6

D) Major in Software Engineering (alongside another Major from other departments)**Total: 39 Credits**

Course Code	Title of Course	Credits
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
CRSC432	Information Security	3
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC356	Software Project Management	3
CRSC454	Software Quality Engineering	3
CRSC482	Final Year Project for CSC	6

E) Major in Software Engineering (alongside two Minors) Total: 45 Credits

Course Code	Title of Course	Credits
CRSC121	Programming Fundamentals	4
CRSC221	Object Oriented Programming	4
CRSC222	Data Structure and Algorithms	4
CRSC223	Operating Systems	3
CRSC242	Database Management Systems	4
CRSC251	Introduction to Software Engineering	3
CRSC432	Information Security	3
CRSC331	Computer Networks	4
CRSC356	Software Project Management	4
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC482	Final Year Project for CSC	6

F) Major in Software Engineering (for Associate Degree Program)

Total: 5 courses

Course Code	Title of Course	Credits
CRSC251	Introduction to Software Engineering	3
CRSC121	Programming Fundamentals	4
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC354	Software Architecture and Design	3

COURSES FOR MINOR IN SOFTWARE ENGINEERING :

Minor in Software Engineering (alongside Major in another discipline) *Total: 4 or 5 courses*

Course Code	Title of Course	Credits
CRSC251	Introduction to Software Engineering	3
CRSC301	Human Computer Interaction	3
CRSC353	Software Requirements Engineering	3
CRSC354	Software Architecture and Design	3
CRSC356	Software Project Management	3
CRSC454	Software Quality Engineering	3