

Scheme of Studies (Bachelor of Science in Computer Science (BSCS))

Semester I

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|--------------|------------------------------------|
| 1. | HU119 | English Comprehension and Composition | - | 3-0-3 |
| 2. | PH 102 | Applied Physics | - | 3-1-4 |
| 3. | HU 115 | Pakistan Studies | - | 2-0-2 |
| 4. | CS180 | Introduction to Information and Communication Technologies | -- | 2-0-2 |
| 5. | CS180L | Introduction to Information and Communication Technologies Lab | -- | 0-1-1 |
| 6. | CS111 | Programming Fundamentals | - | 3-0-3 |
| 7. | CS111L | Programming Fundamentals Lab | - | 0-1-1 |
| | | Total | | 13-3-16 |

Semester II

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|---------------------------------------|-------------------|------------------------------------|
| 1. | HU120 | Communication and Presentation Skills | HU 119 | 3-0-3 |
| 2. | MA110 | Calculus & Analytical Geometry | - | 3-0-3 |
| 3. | CS112 | Object Oriented Programming | CS 111/ CS111L | 3-0-3 |
| 4. | CS112L | Object Oriented Programming Lab | CS 111/ CS111L | 0-1-1 |
| 5. | HU118 | Islamic Studies | - | 2-0-2 |
| 6. | EE223 | Digital Logic Design | | 3-0-3 |
| 7. | EE223L | Digital Logic Design Lab | | 0-1-1 |
| | | Total | | 14-2-16 |

Semester III

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|---|-------------------|------------------------------------|
| 1. | CS270 | Professional Practices | - | 3-0-3 |
| 2. | CS214 | Data Structures and Algorithms | CS112/ CS112L | 3-0-3 |
| 3. | CS214L | Data Structures and Algorithms Lab | CS 112/ CS112L | 0-1-1 |
| 4. | CS223 | Computer Organization and Assembly Language | EE 223/ EE223L | 3-0-3 |
| 5. | CS223L | Computer Organization & Assembly Language Lab | EE 223/ EE223L | 0-1-1 |
| 6. | MA105 | Multivariable Calculus | - | 3-0-3 |
| 7. | MA216 | Discrete Structures | - | 3-0-3 |
| | | Total | | 15-2-17 |

Semester IV

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|---|------------------|------------------------------------|
| 1. | MA301 | Probability and Statistics | - | 3-0-3 |
| 2. | CS225 | Operating Systems | CS214/ CS214L | 3-0-3 |
| 3. | CS225L | Operating Systems Lab | CS214/ CS214L | 0-1-1 |
| 4. | CS281 | Mobile Computing (CS-Elective-I) | - | 2-0-2 |
| 5. | CS281L | Mobile Computing Lab (1CS-Elective-I Lab) | -- | 0-1-1 |
| 6. | CS230 | Database Systems | CS214/ CS214L | 3-0-3 |
| 7. | CS230L | Database Systems Lab | CS214/ CS214L | 0-1-1 |
| 8. | MA201 | Linear Algebra | - | 3-0-3 |
| | | Total | | 14-3-17 |

Semester V

| S# | Course Code | Course Title | Prerequisite | Credit Hrs (Theory – Lab – Total) |
|----|-------------|---|------------------|-----------------------------------|
| 1. | CS360 | Computer Networks | -- | 3-0-3 |
| 2. | CS360L | Computer Networks Lab | - | 0-1-1 |
| 3. | MA202 | Numerical Analysis and Computation | MA105 | 3-0-3 |
| 4. | CS332 | Design and Analysis of Algorithms | CS214/ CS214L | 3-0-3 |
| 5. | HU317 | Interpersonal Skills/ Public Relations | - | 3-0-3 |
| 6. | CS382 | Visual Programming (CS Elective-II) | - | 3-0-3 |
| 7. | CS382L | Visual Programming Lab (CS Elective-II Lab) | - | 0-1-1 |
| | | Total | | 15-2-17 |

Semester VI

| S# | Course Code | Course Title | Prerequisite | Credit Hrs (Theory – Lab – Total) |
|----|-------------|-----------------------------|--------------|-----------------------------------|
| 1. | CS333 | Theory of Automata | - | 3-0-3 |
| 2. | CS340 | Artificial Intelligence | MA216 | 3-0-3 |
| 3. | CS340L | Artificial Intelligence Lab | MA216 | 0-1-1 |
| 4. | CS371 | Software Engineering | - | 2-0-2 |
| 5. | CS371L | Software Engineering Lab | - | 0-1-1 |
| 6. | CS3XX | CS Elective-III | - | 3-0-3 |
| 7. | CS3XXL | CS-Elective-III Lab | - | 0-1-1 |
| 8. | CS3XX | CS Elective-IV | - | 3-0-3 |
| 9. | CS494 | Final Project-I | - | 0-1-1 |
| | | Total | | 14-4-18 |

Semester VII

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|-------------------|---------------------------------------|
| 1 | HU401 | Technical and Business Writing | - | 3-0-3 |
| 2 | CS426 | Parallel and Distributed Computing | CS 225/ CS225L | 2-0-2 |
| | CS426 | Parallel and Distributed Computing Lab | CS225/ CS225L | 0-1-1 |
| 4 | CS415 | Information Security | - | 3-0-3 |
| 5 | CS495 | Final Project – II | CS494 | 0-2-2 |
| 6 | BA356 | Uni. Elective-I Management | | 3-0-3 |
| 7 | MA478 | Graph Theory | | 3-0-3 |
| | | Total | | 14-3-17 |

Semester VIII

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|-------------------------------|--------------|---------------------------------------|
| 1. | CS434 | Compiler Construction | CS333 | 2-0-2 |
| | CS434L | Compiler Construction Lab | CS333 | 0-1-1 |
| 2. | HU414 | University Elective-V | - | 1-0-1 |
| 3 | CS 406 | CS Elective-V | - | 3-0-3 |
| | CS406L | CS-Elective-V Lab | | 0-1-1 |
| 4 | BA354 | (Uni. Elective-II Management) | - | 3-0-3 |
| 5 | EN212 | Chinese (Foreign Language) | - | 3-0-3 |
| 6. | CS496 | Final Project-III | CS 495 | 0-3-3 |
| | | Total | | 12-5-17 |
| | | Grand Total | | 135 Credit Hours |

Scheme of Studies (Bachelor of Science in Cyber Security (BSCYS))

Semester I

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|--------------|------------------------------------|
| 1. | HU119 | English Comprehension and Composition | - | 3-0-3 |
| 2. | CY102 | Introduction to Cyber security | - | 3-0-3 |
| 3. | HU115 | Pakistan Studies | - | 2-0-2 |
| 4. | CS180 | Introduction to Information & Communication Technologies | - | 2-0-2 |
| 5. | CS180L | Introduction to Information & Communication Technologies Lab | - | 0-1-1 |
| 6. | CS 111 | Programming Fundamentals | - | 3-0-3 |
| 7. | CS 111L | Programming Fundamentals Lab | - | 0-1-1 |
| | | Total | - | 13-2-15 |

Semester II

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|-------------------------------------|-------------------|------------------------------------|
| 1. | CYXXX | Cyber Security Elective I | | 2-0-2 |
| 2. | CYXXXL | Cyber Security Elective I Lab | - | 0-1-1 |
| 3. | CY103 | Information Assurance | | 3-0-3 |
| 4. | CS112 | Object Oriented Programming | CS 111/ CS111L | 3-0-3 |
| 5. | CS 112L | Object Oriented Programming Lab | CS 111/ CS111L | 0-1-1 |
| 6. | MA 216 | Discrete Structures | | 3-0-3 |
| 7. | HU 120 | Communication & Presentation Skills | HU 119 | 3-0-3 |
| | | Total | | 16-2-18 |

Semester III

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--------------------------------|------------------|------------------------------------|
| 1. | EE223 | Digital Logic Design | - | 3-0-3 |
| 2. | EE223L | Digital Logic Design Lab | | 0-1-1 |
| 3. | MA201 | Linear Algebra | | 3-0-3 |
| 4. | CS214 | Data Structure & Algorithm | CS112/ CS112L | 3-0-3 |
| 5. | CS214L | Data Structure & Algorithm Lab | CS112/ CS112L | 0-1-1 |
| 6. | MA 110 | Calculus & Analytical Geometry | - | 3-0-3 |
| 7. | CS360 | Computer Networks | - | 3-0-3 |
| | CS360 | Computer Networks | - | 0-1-1 |
| | | Total | | 15-3-18 |

Semester IV

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|---|------------------|------------------------------------|
| 1. | CS225 | Operating Systems | CS214/ CS214L | 3-0-3 |
| 2. | CS225L | Operating Systems Lab | CS214/ CS214L | 3-0-3 |
| 3. | CS223 | Computer Organization & Assembly Language | EE223, EE223L | 0-1-1 |
| 4. | CS223L | Computer Organization & Assembly Language Lab | EE223, EE223L | 2-0-2 |
| 5. | CYXXX | CYS Elective II | -- | 0-1-1 |
| 6. | CY222 | Network Security | CY102 | 3-0-3 |
| 7. | CY222L | Network Security Lab | CY102 | 0-1-1 |
| 8. | CS371 | Software Engineering | - | 3-0-3 |
| 9. | CS371L | Software Engineering Lab | - | 0-1-1 |
| | | Total | | 14-3-17 |

Semester V

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|----------------------------------|------------------|------------------------------------|
| 1. | CS332 | Design and analysis of Algorithm | -- | 3-0-3 |
| 2. | CY334 | Digital Forensics | CY102 | 2-0-2 |
| 3. | CY334L | Digital Forensics Lab | CY102 | 0-1-1 |
| 4. | CY250 | Secure Software Development | | 2-0-2 |
| 5. | CY250L | Secure Software Development Lab | - | 0-1-1 |
| 6. | CYXXX | Cyber Security Elective-III | - | 3-0-3 |
| 7. | CS230 | Database Systems | CS214/ CS214L | 3-0-3 |
| 8. | CS230L | Database Systems Lab | CS214/ CS214L | 0-1-1 |
| 9. | MA106 | Differential Equations | | 3-0-3 |
| | | Total | | 16-3-19 |

Semester VI

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|--------------|------------------------------------|
| 1. | CY355 | Vulnerability Assessment & Reverse Engineering | CY102 | 3-0-3 |
| 2. | CY355L | Vulnerability Assessment & Reverse Engineering Lab | CY102 | 3-0-3 |
| 3. | CS340 | Artificial Intelligence | MA216 | 0-1-1 |
| 4. | CS340L | Artificial Intelligence Lab | MA216 | 2-0-2 |
| 5. | CYXXX | Cyber security Elective IV | - | 0-1-1 |
| 6. | CY206 | Information Security | - | 3-0-3 |
| 7. | CY497 | Final Project-I | - | 0-1-1 |
| 8. | MA301 | Probability and Statistics | - | 3-0-3 |
| | | Total | | 14-3-17 |

Semester VII

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|-------------------|---------------------------------------|
| 1 | BAXXX | University Elective I | - | 3-0-3 |
| 2 | HU401 | Technical & Business Writing | | 2-0-2 |
| | CS426 | Parallel and Distributed Computing | CS 225/ CS225L | 0-1-1 |
| 4 | CS426L | Parallel and Distributed Computing Lab | CS225/ CS225L | 3-0-3 |
| 5 | CY498 | Final Project –II | CS497 | 0-2-2 |
| 6 | BAXXX | University Elective II | | 2-0-2 |
| | | Total | | 10-3-13 |

Semester VIII

| S# | Course Code | Course Title | Prerequisite | Credit Hrs. (Theory – Lab – Total) |
|----|-------------|--|--------------|---------------------------------------|
| 1. | BAXXX | University Elective III | | 3-0-3 |
| | HU414 | Social Service (University Elective V) | | 1-0-1 |
| 2. | CY499 | Final Project – III | | 0-3-3 |
| 3 | CS270 | Professional Practices | | 3-0-3 |
| | BAXXX | University Elective IV | | 3-0-3 |
| | | Total | | 10-3-13 |
| | | Grand Total | | 130 Credit Hours |