**BSCS-Scheme of Studies**

Scheme of studies for Bachelors of Science in Computer Science (BSCS) according to NCEAC and HEC is as follows

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| **Semester 1**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** | **Pre- Requisite** | **Credit Hours** | **Course Code** | | 1 | English Composition and Comprehension |  | 3(3+0) | HUM-111 | | 2 | University Elective-1 |  | 3(3+0) |  | | 3 | Programming Fundamentals |  | 4(3+1) | CS-132 | | 4 | Calculus and Analytical Geometry |  | 3(3+0) | MTH-120 | | 5 | Introduction to Computing |  | 3(2+1) | CS-131 | | 6 | Islamic Studies |  | 2(2+0) | HUM-112 | | **Semester Subtotal** | |  | **18** |  |   **Semester 2**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** | **Pre- Requisite** | **Credit Hours** | **Course Code** | | 1 | Applied Physics |  | 3(3+0) | CS-151 | | 2 | Technical and Business Writing |  | 3(3+0) | HUM-114 | | 3 | Probability & Statistics |  | 3(3+0) | MTH-122 | | 4 | Pakistan Studies |  | 2(2+0) | HUM-115 | | 5 | Object Oriented Programming | Programming Fundamentals | 4(3+1) | CS-133 | | 6 | Discrete Structures |  | 3(3+0) | CS-123 | | **Semester Subtotal** | |  | **18** |  |   **Semester 3**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** | **Pre- Requisite** | **Credit Hours** | **Course Code** | | 1 | Communication and Presentation Skills | English Composition & Comprehension | 3(3+0) | HUM-216 | | 2 | University Elective-2 |  | 3(3+0) |  | | 3 | Digital Logic Design | Applied Physics | 4(3+1) | CS-252 | | 4 | Data Structure and Algorithms | Object-Oriented Programming | 4(3+1) | CS-261 | | 5 | CS Supporting-1 | Calculus and Analytical Geometry | 3(3+0) |  | | **Semester Subtotal** | |  | **17** |  |   **Semester 4**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** |  | **Credit Hours** | **Course Code** | | 1 | Information Security |  | 3(3+0) | CS-271 | | 2 | Software Engineering |  | 3(3+0) | CS-241 | | 3 | Linear Algebra |  | 3(3+0) | MTH-224 | | 4 | Computer Networks |  | 4(3+1) | CS-255 | | 5 | Database Systems | Data Structures & Algorithms | 4(3+1) | CS-241 | | 6 | Social Service (University Elective 3) |  | 1(1+0) |  | | **Semester Subtotal** | |  | **18** |  |   **Semester 5**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** |  | **Credit Hours** | **Course Code** | | 1 | Computer Organization & Assembly Language |  | 4(3+1) | CS-353 | | 2 | CS Supporting-2 | Calculus and Analytical Geometry | 3(3+0) |  | | 3 | Design & Analysis of Algorithm | Data Structures & Algorithms | 3(3+0) | CS-362 | | 4 | Artificial Intelligence | Discrete Structures | 4(3+1) | CS-391 | | 5 | CS Elective-1 |  | 3(3+0) |  | | **Semester Subtotal** | |  | **17** |  |   **Semester 6**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** |  | **Credit Hours** | **Course Code** | | 1 | Operating Systems | Data Structures & Algorithms | 4(3+1) | CS-354 | | 2 | Foreign Language (University Elective-4) |  | 2(2+0) | HUM-317 | | 3 | University Elective-5 |  | 3(3+0) |  | | 4 | CS Elective-2 |  | 3(3+0) | CS-336 | | 5 | CS Elective-3 |  | 3(3+0) | CS-351 | | 6 | CS Elective-4 |  | 3(3+0) |  | | **Semester Subtotal** | |  | **18** |  |   **Semester 7**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** |  | **Credit Hours** | **Course Code** | | 1 | Final Year Project Part-I |  | 3(0+3) | CS-401 | | 2 | Theory of Automata |  | 3(3+0) | CS-363 | | 3 | CS Supporting-3 |  | 3(3+0) |  | | 4 | Parallel & Distributed Computing | Operating Systems | 3(3+0) | CS-457 | | **Semester Subtotal** | |  | **12** |  |   **Semester 8**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Serial #** | **Course Name** |  | **Credit Hours** | **Course Code** | | 1 | Final Year Project Part-II |  | 3(0+3) | CS-402 | | 2 | Compiler Construction | Theory of Automata | 3(3+0) | CS-465 | | 3 | CS Elective-5 |  | 3(3+0) |  | | 4 | Professional Practices |  | 3(3+0) | CS-484 | | **Semester Subtotal** | |  | **12** |  |   **Total Credit Hours** = 18+18+17+18+17+18+12+12 = **130**   1. **Computer Science – Elective Courses Not limited to the list below**  * Software Requirements & Specifications 3 (3+0) * Software Quality Assurance 3 (3+0) * Software Project Management 3 (3+0) * Mobile Application Development 3 (2+1) * Human Computer Interaction 3 (3+0) * Theory of Programming Languages 3 (3+0) * Computer Graphics 3 (2+1) * Digital Image Processing 3 (2+1) * Digital Signal Processing 3 (3+0) * Computer Vision 3 (3+0) * Distributed Computing 3 (2+1) * Data and Network Security 3 (3+0) * Wireless Networks 3 (2+1) * Social Computing 3 (3+0) * Web Design and Development 3 (2+1) * Data Warehousing 3 (2+1) * Expert Systems 3 (3+0) * Artificial Neural Network 3 (3+0) * Fuzzy Logic 3 (3+0) * Web Engineering 3 (3+0) * Fundamentals of Data Mining 3 (3+0) * Computational Intelligence 3 (3+0) * Multi Agent Systems 3 (3+0) * Natural Language Processing 3 (3+0) * Game Development 3 (3+0) * Logical Paradigms of Computing 3 (3+0) * Formal Methods for Software Engineering 3 (3+0)  1. **University Elective Courses (List is not exhaustive)**  * Fundamentals of Financial Accounting 3 (3+0) * Financial Management 3 (3+0) * Introduction to Management 3 (3+0) * Entrepreneurship 3 (3+0) * Foreign Language 2 (2+0) * Human Resource Management 3 (3+0) * Marketing 3 (3+0) * Economics 3 (3+0) * International Relations 3 (3+0) * Foreign/Regional Language (French, German, Sindhi, Punjabi, Urdu etc.) 3 (3+0) * Philosophy 3 (3+0) * Introduction to Social Work 1 (1+0) * Social Welfare System in Pakistan 1 (1+0) * Society and Social Institution 1(1+0) * Human Growth & Personality Development 1 (1+0)  1. **Undergraduate Minor\*** 2. Elective courses for Artificial Intelligence Specialization:  * Programming for Artificial Intelligence 3(2+1) * Machine Learning 3(2+1) * Artificial Neural Networks 3(2+1) * Knowledge Representation & Reasoning 3(3+0) * Computing Vision 3(2+1)  1. Elective Courses for Data Science Specialization:  * Advance Statistics 3(3+0) * Introduction to Data Science 3(2+1) * Data Mining 3(2+1) * Data Visualization 3(2+1) * Data Warehousing & Business Intelligence 3(2+1)   c) Elective Courses for Cyber Security Specialization:   * Introduction to Cyber Security 3(3+0) * Digital Forensics 3(2+1) * Information Assurance 3(3+0) * Network Security 3(2+1) * Secure Software Design and Development 3(2+1)   **\*** Undergraduate minors may be offered as CS electives in above scheme of study. |