**Program Road Map**

4-Year Program (132 Credit Hours)

**Semester I**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre. Req.** |
| IT1091 | Introduction to ICT | 2 |  |
| IT1091L | Introduction to ICT Lab | 1 |  |
| CC1021 | Programming Fundamentals | 3 |  |
| CC1021L | Programming Fundamentals Lab  | 1 |  |
| EN111 | English Grammar and Comprehension | 3 |  |
| MA107 | Calculus and Analytical Geometry | 3 |  |
| POL101 | Pak Studies | 3 |  |
|  | **Total** | **16 (14-2)** |  |

**Semester II**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-Req.** |
| CC1022 | Object Oriented Programming | 3 | Prog Fundamentals |
| CC1022L | Object Oriented Programming Lab | 1 |  |
| CS2031 | Digital Logic Design | 3 |  |
| CS2031L | Digital Logic Design Lab | 1 |  |
| MA210 | Linear Algebra | 3 | Cal. & Anal. Geometry |
| CC1041 | Discrete Structures | 3 |  |
| EN125 | Composition and Communication | 3 | English Grammar and Comprehension |
|  | **Total** | **17 (15-2)** |  |

**Semester – III**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CC2042 | Data Structure & Algorithms | 3 | Prog. Fundamentals |
| CC2042L | Data Structures & Algorithms Lab  | 1 |  |
| CC2141 | Database Systems | 3 |  |
| CC2141L | Database Systems Lab | 1 |  |
| AI2151 | Artificial Intelligence | 3 | Object Oriented Prog |
| AI2151L | Artificial Intelligence Lab | 1 |  |
| MA150 | Probability & Statistics | 3 |  |
| MA230 | Differential Equations | 3 | Cal. & Anal. Geometry |
|  | **Total** | **18 (15-3)** |  |

**Semester – IV**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CC3071 | Computer Networks | 3 |  |
| CC3071L | Computer Networks Lab | 1 |  |
| CS2032 | Computer Organization and Assembly Language | 3 | Digital Logic Design |
| CS2032L | Computer Organization and Assembly Language Lab | 1 |  |
| CS3044 | Analysis of Algorithms | 3 | Data Structures & Algo |
| AI2101 | Programming for Artificial Intelligence | 2 | Artificial Intelligence |
| AI2101L | Programming for Artificial Intelligence Lab | 1 |  |
| CC2101 | Software Engineering | 3 |  |
|  | **Total** | **17 (14-3)** |  |

**Semester - V**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CC3011 | Operating System  | 3 | Data Structures & Algo |
| CC3011L | Operating System Lab | 1 |  |
| CC2101 | Machine Learning | 2 | Programming for AI |
| CC2101L | Machine Learning Lab | 1 |  |
| AI4152  | Deep Learning and Neural Networks | 3 | Programming for AI |
| CC3121 | Information Security | 3 |  |
|  | University Elective-1 | 3 |  |
|  | **Total** | **16 (14-2)** |  |

**Semester - VI**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CS4172 | Parallel & Distributed Computing | 2 | OOP, Operating Sys |
| CS4172L | Parallel & Distributed Computing Lab | 1 |  |
| CS4013 | Computer Vision | 2 |  - |
| CS4013L | Computer Vision Lab | 1 |  |
|  | Knowledge Representation & Reasoning | 3 | Programming for AI |
| CS4156 | Natural Language Processing | 3 | - |
|  | AI Elective-1 | 3 |  |
|  | University Elective-2 | 3 |  |
|  |  **Total** | **18 (16-2)** |  |

**Semester - VII**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CC4981 | Capstone Project Part I | 3 |  |
| EN220 | Research Paper Writing and Presentation | 3 | Composition and Communication |
| SD100 | English Immersion  | 0 |  |
| ISL101 | Islamic Studies | 3 |  |
|  | AI Elective-2 | 3 |  |
|  | AI Elective-3 | 3 |  |
|  | **Total** | **15 (15-0)** |  |

**Semester - VIII**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Course Title** | **Cr. Hr.** | **Pre-requisite** |
| CC4991 | Capstone Project Part II | 3 | Capstone Project Part I |
| HU4092 | Professional Practices | 3 |  |
|  | University Elective-3 | 3 |  |
|  | University Elective-4 | 3 |  |
|  | AI Elective-4 | 3 |  |
| SD102 | 21st Century Skills | 0 |  |
|  | **Total** | **15(15-0)** |  |