**COMPLIANCE CERTIFICATE FOR UNDERGRADUATE 2.0 POLICY**

**Program Name: \_\_\_\_\_\_ARTIFICIAL INTELLIGENCE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Program Scheme of Studies**

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| --- | --- | --- |
| **Structure of the Scheme** | | |
| **Courses Credit Hours** | 1-4 |
| **Core Courses:**  (Credit Hours) | 47 |
| **Foundation Courses:**  (Credit Hours) | 12 |
| **Major Courses:**  (Credit Hours) | 18 |
| **Technical Electives:**  (Credit Hours) | 21 |
| **General Electives:**  (Credit Hours) | 35 |
| **Supporting Science:**  (Credit Hours) | 0 |
| **University Electives:**  (Credit Hours) | 3 |
| **Undergraduate 2.0 courses**  (Credit hours) | Distributed above |
| **Total Credit Hours:** | 136 |

**Program Road Map**

**Applicable to Batch No. \_\_F2023376\_\_\_\_\_\_\_ Session \_\_\_\_\_\_\_\_F2023\_\_\_\_\_\_**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1st Year** | | | | | | | |
| **Fall Semester** (1st) | | | | **Spring Semester** (2nd) | | | |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** | **Code** | **Course Title** | **Cr. Hrs** | **Prerequisite** |
| CC111 | Programming Fundamentals | 3 |  | ISL112 | Islamic thought and perspectives | 3 |  |
| CC111L | Programming Fundamentals Lab | 1 |  | EN123 | English II | 3 | EN110 |
| MA107 | Calculus and Analytical Geometry | 3 |  | MA102 | (AI supporting 1)  Multivariable Calculus | 3 | MA107 |
| CC120 | Application of Information & Communication Technologies | 2 |  | CC112 | Object Oriented Programming | 3 | CC111, CC111L |
| CC120L | Application of Information & Communication Technologies lab | 1 |  | CC112L | Object Oriented Programming Lab | 1 | CC111, CC111L |
| EN110 | English I | 3 |  | CC121 | Digital Logic Design | 2 |  |
| NS125 | Applied Physics | 2 |  | CC121L | Digital Logic Design Lab | 1 |  |
| NS125L | Applied Physics Lab | 1 |  | CC141 | Discrete Structures | 3 |  |
| POL121 | Pakistan: Ideology, Constitution, and Society | 3 |  |  |  |  |  |
| **Semester Credit Hours** | | **19** |  | **Semester Credit Hours** | | **19** |  |
| **2 Year** | | | | | | | |
| **Fall Semester** (3rd) | | | | **Spring Semester** (4th) | | | |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** | **Code** | **Course Title** | **Cr. Hrs** | **Prerequisite** |
| CC213 | Data Structures | 3 | CC112, CC112L | CC251 | Computer Networks | 2 |  |
| CC213L | Data Structures Lab | 1 | CC112, CC112L | CC251L | Computer Networks Lab | 1 |  |
| CC281 | Software Engineering | 3 |  | CC230 | Database Systems | 3 |  |
| MA150 | Probability & Statistics  (AI Supporting 3) | 3 |  | CC230L | Database Systems Lab | 1 |  |
| MA210 | Linear Algebra  (AI Supporting 2) | 3 | MA107 | AI271 | Programming for AI | 2 |  |
| CC222 | Computer Organization & Assembly Language | 2 | CC121, CC121L | AI271L | Programming for AI Lab | 1 |  |
| CC222L | Computer Organization & Assembly Language | 1 | CC121, CC121L |  | Technical Elective 1 (e.g., Open-Source Software Development) | 3 |  |
| SD210 | Civics and Community Engagement | 2 |  |  | University Elective 1 | 3 |  |
|  |  |  |  | HU201 | Professional Practices | 3 |  |
| **Semester Credit Hours** | | **18** |  | **Semester Credit Hours** | | **19** |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **3rd Year** | | | | | | | |
| **Fall Semester** (5th) | | | | **Spring Semester** (6th) | | | |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** | **Code** | **Course Title** | **Cr. Hrs** | **Prerequisite** |
| CC323 | Operating Systems | 3 |  |  | Technical Elective 3 | 3 |  |
| CC323L | Operating Systems Lab | 1 |  | CC361 | Information Security | 3 |  |
| CC371 | Artificial Intelligence | 3 | CC213, CC213L | SD102 | 21st Century | 0 |  |
| CC342 | Analysis of Algorithms | 3 | CC213, CC213L |  |  |  |  |
| MG224 | Innovation and entrepreneurship | 3 |  | AI374 | Knowledge Representation & Reasoning | 3 | AI271, AI271L |
|  | Technical Elective2 | 3 |  | AI473 | Artificial Neural Networks & Deep Learning | 2 | AI372, AI372L |
| AI372 | Machine Learning | 2 | AI271, AI271L | AI473L | Artificial Neural Networks & Deep Learning Lab | 1 | AI372, AI372L |
| AI372L | Machine Learning Lab | 1 | AI271, AI271L |  | Technical Elective 4 | 3 |  |
| SD100 | English Immersion | 0 |  | EN220 | Technical & Business Writing- AI Supporting 4 | 3 | EN125 |
| **Semester Credit Hours** | | **19** |  | **Semester Credit Hours** | | **18** |  |
|  | | | | | | | |
| **4th Year** | | | | | | | |
| **Fall Semester** (7th) | | | | **Spring Semester** (8th) | | | |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** | **Code** | **Course Title** | **Cr. Hrs** | **Prerequisite** |
| AI375 | Computer Vision | 2 | AI473, AI473L |  | Univ. Elective 2 | 3 |  |
| AI375L | Computer Vision Lab | 1 | AI473, AI473L |  | Technical Elective 7 | 3 |  |
|  | Technical Elective 5 | 3 |  | CC492 | Final Year Project – II/COOP2\* | 4 | CC491 |
|  | Technical Elective 6 | 3 |  |  |  |  |  |
| CC425 | Parallel and Distributed Computing | 3 | CC323, CC323L\ |  |  |  |  |
| CC491 | Final Year Project – I/COOP1\* | 2 |  |  |  |  |  |
| **Semester Credit Hours** | | **14** |  | **Semester Credit Hours** | | **10** |  |
|  | |  |  | **Total credit hours** | | **136** |  |

**\*COOP means FYP undertaken in the industry.**

**Total Credit Hours: 136**

**List of Electives (Add list of electives for this program)**

|  |  |  |
| --- | --- | --- |
|  | **Technical Electives** | **Cr. Hr.** |
| AI391 | Natural Language Processing | 3(3-0) |
| AI392 | Speech Processing | 3(3-0) |
| DS393 | Data Mining | 3(2-1) |
| AI393 | Reinforcement Learning | 3(3-0) |
| AI394 | Large Language Models | 3(3-0) |
| AI376 | Fuzzy Systems | 3(3-0) |
| AI 377 | Introduction to Robotics | 3(2-1) |
| AI378 | Agent Based Modeling | 3(3-0) |
| CS393 | Mobile Application Development | 3(2-1) |
| IT291 | Web Technologies | 3(2-1) |
| AI 379 | Topics in AI | 3(3-0) |
| DS 391 | Big Data Analytics | 3(3-0) |
| SE494 | Open-Source Software Development | 3(2-1) |
| IT352 | Internet of Things | 3(3-0) |
| IT461 | Blockchain Technology and Application | 3(3-0) |

**University Elective 1 (3 Credit Hours) (From Arts and Humanities)**

**Arts and Humanities (3 Credit Hours) Min One Course**

|  |  |  |
| --- | --- | --- |
| **Course Code** | **Course** | **Cr. Hr.** |
| **SD221** | Life and Learning | **3** |
| **SD222** | Foreign Language | **3** |
| **SD223** | Logical Reasoning | **3** |

**University Elective 2 (3 Credit Hours) (From Social Sciences)**

**Social Sciences (3 Credit Hours) Min One Course**

|  |  |  |
| --- | --- | --- |
| **Course Code** | **Course** | **Cr. Hr.** |
| **HWB101** | Health and Wellbeing | **3** |
| **SOC102** | Understanding Society and Sociocultural Dynamics | **3** |
| **PSY110** | Psychology of Mind and Behavior | **3** |
| **ECO202** | Economics | **3** |
| **MK210** | Principles of Marketing | **3** |
| **MG120** | Principles of Management | **3** |

**Note:**

The program BS Artificial Intelligence (BS-AI) is accredited by NCEAC. The roadmap must contain the courses provided by the NCEAC. Some of the courses we offer differ from those prescribed by UMT UG 2.0 but they are those that are mandated by NCEAC and do fulfill the requirements of the respective areas of UG 2.0. The roadmap is compliant with all the other courses proposed in UG 2.0.

**It is hereby certified that curriculum of \_\_\_\_\_\_\_Artificial Intelligence\_\_\_\_\_\_\_\_ program, Session \_\_F2023\_\_\_\_\_\_\_\_\_ is compliant to Undergraduate 2.0 Policy. All the courses of UG 2.0 are incorporated in the roadmap accordingly.**

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**Chairperson of Department Dean concerned**

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**Director AAQIC Registrar**