COMPLIANCE CERTIFICATE FOR UNDERGRADUATE 2.0 POLICY

**Program Name: BS Software Engineering (BSSE)**

**Program Scheme of Studies**

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| **Structure of the Scheme** |
| **Courses Credit Hours** | 1 – 4 |
| **Core Courses:**(Credit Hours) | 14 : (47) |
| **Foundation Courses:**(Credit Hours) |  |
| **Major Courses:**(Credit Hours) | 6 : (18) |
| **Technical Electives:**(Credit Hours) | 7 : (21) |
| **General Electives:**(Credit Hours) | 12 : (35) |
| **Supporting Science Courses:**(Credit Hours) | 4 : (12) |
| **University Electives:**(Credit Hours) | 1 : 3 |
| **Undergraduate 2.0 Courses:**(Credit hours) | Distributed Above |
| **Total Credit Hours:** | 136 |

**Program Road Map**

**Applicable to:**

**Batch No.: 4**

**Session: FALL 2023**

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| **1st Year** |
| **1st Semester**  | **2nd Semester**  |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** | **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** |
| CC120 | Application of Information & Communication Technologies | 2 | - | CC112 | Object Oriented Programming | 3 | CC111CC111L |
| CC120L | Application of Information & Communication Technologies Lab | 1 | - | CC112L | Object Oriented Programming Lab | 1 | CC111CC111L |
| CC111 | Programming Fundamentals | 3 | – | MA150 | Probability and Statistics | 3 | - |
| CC111L | Programming Fundamentals Lab | 1 | – | CC141 | Discrete Structures | 3 | - |
| MA107 | Calculus and Analytical Geometry | 3 | – | MA108 | Multivariable Calculus | 3 | MA107 |
| EN110 | English-I | 3 | – | NS125 | Applied Physics | 2 | - |
| ISL112 | Islamic Thought and Perspectives | 3 | – | NS125L | Applied Physics Lab | 1 | – |
| POL121 | Pakistan: Ideology, Constitution, and Society | 3 | – | EN123 | English-II | 3 | EN110 |
| **Semester Credit Hours** | 19 |   | **Semester Credit Hours** | 19 |   |

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| **2nd Year** |
| **3rd Semester**  | **4th Semester**  |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite**  | **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** |
| CC213 | Data Structures | 3 | - | CC251 | Computer Networks | 2 | – |
| CC213L | Data Structures Lab | 1 | - | CC251L | Computer Networks Lab | 1 | – |
| MA210 | Linear Algebra | 3 | - | CC230 | Database Systems | 3 | - |
| CC281 | Software Engineering | 3 | – | CC230L | Database Systems Lab | 1 | - |
| CC121 | Digital Logic Design | 2 | – | SE282 | Software Requirement Engineering | 2 | CC281 |
| CC121L | Digital Logic Design Lab | 1 | – | SE282L | Software Requirement Engineering Lab | 1 | CC281 |
|  | University Elective I | 3 | – | CC222 | Computer Organization and Assembly Language | 2 | CC121CC121L |
| SD210 | Civics and Community Engagement | 2 | - | CC222L | Computer Organization and Assembly Language Lab | 1 | CC121CC121L |
|  |  |  |  | HU201 | Professional Practices | 3 | – |
|  |  |  |  |  | Technical Elective I | 3 | – |
| **Semester Credit Hours** | 18 |   | **Semester Credit Hours** | 19 |   |

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| **3rd Year** |
| **5th Semester**  | **6th Semester**  |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite**  | **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** |
| CC323 | Operating Systems | 3 | - | SE384 | Software Construction and Development | 2 | CC281 |
| CC323L | Operating Systems Lab | 1 | - | SE384L | Software Construction and Development Lab | 1 | CC281 |
| CC371 | Artificial Intelligence | 3 | – | SE385 | Software Quality Engineering | 2 | CC281 |
| CC342 | Analysis of Algorithms | 3 | CC213CC213L | SE385L | Software Quality Engineering Lab | 1 | CC281 |
| SE383 | Software Design and Architecture | 2 | CC281 | CC361 | Information Security | 3 | – |
| SE383L | Software Design and Architecture Lab | 1 | CC281 | EN220 | Technical and Business Writing | 3 | EN123 |
| SD100  | English Immersion | 0 |  |  | Technical Elective III | 3 | – |
|  | Technical Elective II | 3 | – |  | Technical Elective IV | 3 | – |
| MG224 | Innovation and Entrepreneurship | 3 | – | SD102 | 21st Century Skills | 0 | - |
| **Semester Credit Hours** | 19 |  | **Semester Credit Hours** | 18 |  |

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| **4th Year** |
| **7th Semester**  | **8th Semester**  |
| **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite**  | **Code** | **Course Title** | **Cr. Hrs.** | **Prerequisite** |
| CC491 | Final Year Project I/ COOP-I\* | 2 | - | CC492 | Final Year Project II/ COOP-II \* | 4 | CC491 |
| SE486 | Software Project Management | 3 | CC281 |  | University Elective II | 3 | – |
| CC425 | Parallel and Distributed Computing | 3 | CC323CC323L |  | Technical Elective VII | 3 | - |
|  | Technical Elective V | 3 | – |  |  |  |  |
|  | Technical Elective VI | 3 | – |  |  |  |  |
| **Semester Credit Hours** | 14 |  | **Semester Credit Hours** | 10 |  |

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

**Total Credit Hours: 136**

**(Non-exhaustive) List of Technical Electives:**

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| **Course Code** | **Course** | **Cr. Hr.** |
| **SE489** | Software Verification and Validation (Testing & QA) | **3** |
| **SE394** | Object Oriented Analysis and Design | **3** |
| **CS245** | Computer Architecture | **3** |
| **CS341** | Theory of Automata | **3** |
| **CS324** | HCI and Computer Graphics | **3** |
| **IT291** | Web Technologies | **2+1** |
| **CS431** | Advanced Database Management | **2+1** |
| SE493 | Web Engineering | **2 +1** |
| **DS291** | Introduction to Data science | **2+1** |
| **SE488** | Software Re-Engineering | **3** |
| **SE491** | Mobile Application Development | **2+1** |
| **SE492** | Open Source Software Development | **3** |
| **SE496** | Operation Research | **3** |
| **SE387** | Formal Method in Software Engineering | **3** |
| **SE495** | Game Design and Development | **2+1** |
| **…** | **…** | **…** |

**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**

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

**Note:**

The program BS Software Engineering (BSSE) 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 BSSE program, Session Fall 2023 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, Dean,**

**Department of Software Engineering School of Systems and Technology**

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**Director, Registrar**

**Accreditations and Academic Quality Improvement Cell (AAQIC) University of Management and Technology**