| B. Tech. Civil Engineering | | | | |
|---|---|---|---|---|
| **Course code: Course Title** | **Course Structure** | | | **Pre-Requisite** |
| **CE414: Urban Planning and Flood Management** | **L** | **T** | **P** | **Nil** |
| | **3** | **0** | **2** | |

**Course Objective:** The course introduces students to the fundamental principles of urban planning and flood management. It covers planning methodologies, flood risk assessment, and sustainable management strategies. Students will gain theoretical and practical knowledge to design and implement effective flood mitigation measures in urban environments.

| S. No | Course Outcomes (CO) |
|---|---|
| **CO1** | Understand urban hydrology and its impact on flood occurrences. |
| **CO2** | Analyze flood risk and design appropriate flood management strategies. |
| **CO3** | Evaluate urban planning techniques for mitigating flood risks. |
| **CO4** | Apply GIS and remote sensing tools for flood risk mapping. |
| **CO5** | Implement sustainable urban drainage systems and flood resilience measures. |

| S. No. | Contents | Contact Hours |
|---|---|---|
| **UNIT 1** | **Introduction to Urban Planning and Floods**: Urban planning concepts and their relationship with flooding. The causes and types of urban flooding, impact of urbanization on water management. Case studies on major urban flood disasters highlighting key challenges and solutions. | 8 |
| **UNIT 2** | **Flood Hydrology and Risk Assessment**: Hydrologic cycle, flood hydrograph analysis, and rainfall-runoff relationships. Flood frequency analysis techniques and flood risk assessment ethodologies, vulnerability mapping to understand the extent and severity of urban floods. | 10 |

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|---|---|---|
| **UNIT 3** | **Urban Drainage and Flood Management Strategies**: Traditional and modern urban drainage systems. Sustainable urban drainage systems (SUDS), green infrastructure for flood mitigation, and urban flood modeling techniques. Strategies for reducing flood risks through improved drainage planning and management. | 8 |
| **UNIT 4** | **IS and Remote Sensing in Flood Management**: GIS and remote sensing applications in flood management. Flood risk mapping, satellite-based flood monitoring, and case studies showcasing how GIS tools assist in flood preparedness and mitigation planning. | 8 |
| **UNIT 5** | **Policy, Governance, and Climate Change Impacts**: Urban flood management policies, governance frameworks, and the role of different stakeholders in flood mitigation. The impact of climate change on urban flooding and strategies for enhancing urban resilience to extreme weather events, Future trends in flood management. | 8 |
| | **Total** | **42** |

**REFERENCES**


| S. No. | Name of Books/Authors/Publishers | Year of Publication / Reprint |
|---|---|---|
| 1 | Kundzewicz, Z.W., "Flood Risk Science and Management", Cambridge University Press. | 2012 |
| 2 | Ashley, R., Garvin, S., Pasche, E., Vassilopoulos, A., Zevenbergen, C., "Advances in Urban Flood Management", CRC Press. | 2007 |
| 3 | Chow, V.T., "Handbook of Applied Hydrology", McGraw-Hill. | 1964 |
| 4 | Schanze, J., Zeman, E., Marsalek, J., "Flood Risk Management: Hazards, Vulnerability and Mitigation Measures", Springer. | 2006 |