**Department of Architecture**

**School of Architecture and planning**

**University of Management and technology**

**Course Outline (on OBE)**

## UMT’s Vision

## *Our Vision is... Learning*

It defines our existence, inspires all stakeholders associated with us, creates a powerful momentum inside, and responds to the challenges outside. It continues to evolve as present captures new realities and foresight to unfold new possibilities. All in an incessant attempt to help individuals and organizations discover their God-given potentials to achieve Ultimate Success actualizing the highest standards of efficiency, effectiveness, excellence, equity, trusteeship and sustainable development of global human society.

## UMT Mission

Our Mission is.... Leading

We aspire to become a learning institution and evolve as the LEADING COMMUNITY for the purpose of integrated development of the society by actualizing strategic partnership with stakeholders, harnessing leadership, generating useful knowledge, fostering enduring values, and projecting sustainable technologies and practices.

### Mission of the School

The mission of the School is to provide the best leadership in the fields of the built environment; particularly in the development, management and innovation in the fields of architecture, urban planning and related specializations and sub-specializations

### Mission of the Department

At the Department of Architecture our mission is to challenge the participants to develop their abilities in solving complex problems by thinking creatively & informed decision making as a core of their professional schooling. Offering them a diverse interdisciplinary and meticulous program of studies led by an adroit faculty in a comprehensive studios or class environment and preparing them for leadership roles in the field of Architecture, Construction, Landscape, Built Environment and community development.

**Course Outline**

**Course code - AR-224 Course title - Materials, Construction and Services**

|  |  |
| --- | --- |
| Program | B.ARCH |
| Credit Hours | 3+0 |
| Duration | **Course: Spring Semester 2023**  15 Weeks + Examination |
| Prerequisites | Materials and Construction-II |
| Resource Person | Najam-ul-Haq  Madiha Ghafoor |
| Counseling Timing  (Room# ) | As per timetable |
| Contact | najam.haque@umt.edu.pk  madiha\_ghafoor@umt.edu.pk |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Program educational objectives (PEO’s)**

**PEO-1:** Able to interpret and elaborate architectural knowledge, communication, graphical and computer skills.

**PEO- 2:** Able to develop building and architectural plans through design coordination selecting suitable materials and construction techniques.

**PEO-3:** Able to propose appropriate solution to complex building issues and adapt recent developments in architecture focusing on research, creativity and innovation.

**PEO-4:** Able to maximize ethics by keeping spirit of discipline and respecting the professional codes and society.

**Program Learning outcomes PLO’s)**

Graduates of the B-Architecture at UMT are expected to have acquired and developed the following set of knowledge, skills and personality traits (these are also referred to as graduate attributes).

**PLO 1 Architectural Knowledge:** An ability to illustrate, architectural fundamentals through verbal and graphical Techniques

**PLO 2 Design Analysis and development:** An ability to identify literature and analyze architectural problems reaching substantiated conclusions to meet specified needs with appropriate societal and environmental consideration.

**PLO 3 Case study analysis:** An ability to analyze architectural issues in a methodical way including design, field surveys, interpretation of field data, and synthesis of information to derive valid conclusions.

**PLO 4 Digital Tool Usage:** An ability to create, select and apply appropriate techniques, resources, and modern architectural computer simulations, including prediction and modeling, to complex activities, with an understanding of the limitations.

**PLO 5 Environment and Sustainability:** An ability to propose sustainable solutions to environmental problems through architectural design thinking.

**PLO 6 Project Management:** An ability to demonstrate management skills and leadership qualities in individual and teamwork capacity.

**PLO 7 Design Coordination:** An ability to coordinate effectively across different sectors of construction industry. (Material suppliers, Electrical plumbing, HVAC and Civil works).

**PLO 8 Ethics and the society:** An ability to apply ethical principles and professional codes of the profession following the social norms to the best interest of the mankind.

**Course Learning outcomes (CLO’s)**

* Illustrate basic concepts and principles of mechanical circulation modes used in buildings. (C2)
* Identify the necessities in buildings and available technological solution regarding the MEP systems. (A1)
* Analyze the requirements of a building for fire safety by interpreting design guidelines and standard requirements. (C4)
* Develop understandings about fundamentals of solid waste management. (C3)
* Compare different technological solution and equipment in the market for automated parking. (A5)

|  |  |  |  |
| --- | --- | --- | --- |
| **CODE** | **NAME** | **CLO** | **CLO Type** |
| 224.1 | 224.C1 | Illustrate basic concepts and principles of mechanical circulation modes used in buildings. | C2 |
| 224.2 | 224.C2 | Identify the necessities in buildings and available technological solution regarding the MEP systems. | A1 |
| 224.3 | 224.C3 | Analyze the requirements of a building for fire safety by interpreting design guidelines and standard requirements. | C4 |
| 224.4 | 224.C4 | Develop understandings about fundamentals of solid waste management. | C3 |
| 224.5 | 224.C5 | Compare different technological solution and equipment in the market for automated parking. | A5 |

**Mapping of CLO’s to Program’s Learning outcomes(PLO’S)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Semester** | **Course Code** | **Title** | **Course Learning outcomes** | **PLO 1: Architectural Knowledge** | **PLO 2: Design Analysis and development** | **PLO3: Case study analysis Design/Development of Solutions Design/Development of Solutions Design/Development of Solutions** | **PLO 4: Digital Tool Usage** | **PLO 5: Environment and Sustainability** | **PLO 6: Project Management** | **PLO 7: Design Coordination** | **PLO 8: Ethics and the society** |
| **4th- SEMESTER** | **AR-224** | **Materials, Construction and Services** | Illustrate basic concepts and principles of mechanical circulation modes used in buildings. (C2) |  |  |  |  |  |  | √ |  |
| Identify the necessities in buildings and available technological solution regarding the MEP systems. (A1) |  |  |  |  |  |  | √ |  |
| Analyze the requirements of a building for fire safety by interpreting design guidelines and standard requirements. (C4) |  |  |  |  |  |  | √ |  |
| Develop understandings about fundamentals of solid waste management. (C3) |  |  |  |  |  |  | √ |  |
| Compare different technological solution and equipment in the market for automated parking (A5). |  |  | √ |  |  |  |  |  |

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

# **Marks Evaluation Marks in percentage**

Assignments 15%

Quizzes 10%

Mid 25%

Final exam 50%

**Total 100%**

**Recommended Text Books:**

**Reference Books:**

* Building Construction by P.C.Varghese
* Time Saver Standards for Material Types by Joseph De Chiara and Johan Hancook Callender
* Z. H. Syed, Materials for Construction
* Architectural working drawings (Residential & Commercial) by William Perkins Spence

**Course Schedule**

|  |  |  |
| --- | --- | --- |
| **Weeks** | **Topics** | **Textbook /**  **Reference Readings** |
| Week 1-2 | **Mechanical Services**  Lifts/elevators, Escalators. | Class Notes |
| Week 3-4 | **Water supply and sewerage**  (Hot and cold-water supply systems, estimation of requirement, piping materials, storage tanks, and single/double stack system.  Surface drainage/Roof drainage, Building drainage, Man holes, floor traps, grease trap/gully trap, Septic tank)  **Quiz-1** | Class Notes |
| Week 5-6 | **Electrical Wiring**  Cables, Conduiting, DBS, Earthing, Design considerations. | Class Notes |
| Week 7-8 | **HVAC**  Introduction to Air-conditioning systems, ventilation, HVAC components, merits/ demerits of different AC systems.  **Quiz-2** |  |
| **WEEK 9: Mid Term Exam** | | |
| Week 10-11 | **Mechanical Parking Systems**  Visit to any building construction site to develop understanding of practical application process of various services. | Class Notes |
| Week 12-13 | **Fire Fighting Systems**  Fire fighting systems (fire sprinkler systems), Fire safety regulations, exits/stairs, fire alarm systems.  **Quiz-3** | Class Notes |
| Week 14-15 | **Solid Waste Management**  Waste collection, Land fills sites, Garbage chutes in apartments, Recycling of waste. | Class Notes |
| Week 16 | **Final Term Exam** |  |