**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 OUTLINES**

**(**Here course outlines of the course being taught by the individuals be added.)

**Program educational objectives (PEO’s) of Bachelor of Architecture**

**PEO 1:** Ability to comprehend architectural skills manual as well as relevant computer programs

and think creatively and identify new trends in Architectural design

**PEO 2:** Critical learning for a broad function in various areas of Architectural sciences and

building technology including building materials, construction techniques, structural, mechanical, electrical, environmental, earthquake, and construction management

**PEO 3:** Ability to keep themselves abreast with recent developments in the relevant Architecture

and a broad theoretical and conceptual base focusing on research, creativity and

 innovation

**PEO 4:** Spirit of discipline and respect for the code of ethics of the profession.

**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 apply knowledge of mathematics, science, architectural fundamentals and an architectural specialization to the solution of complex architectural problems.

**PLO 2** **Design Analysis:** An ability to identify, formulate, search literature, and analyze complex architectural problems reaching substantiated conclusions using principles of natural sciences and architecture.

**PLO 3** **Design/Development of Solutions:** An ability to design solutions for complex architectural problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

**PLO 4** **Case study analysis:** An ability to investigate complex architectural problems in a methodical way including literature survey, design and conduct of field surveys, analysis and interpretation of field data, and synthesis of information to derive valid conclusions.

**PLO 5** **Modern 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 6** **The Architect and Society:** An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional architectural practice and solution to complex problems.

**PLO 7** **Environment and Sustainability:** Ability to understand the impact of professional architectural solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

**PLO 8** **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of architectural practice.

**PLO 9** **Individual and Team Work:** An ability to work effectively, as an individual or in a team, on multifaceted and/or multidisciplinary settings.

**PLO 10** **Communication:** An ability to communicate effectively, orally and written, on complex architectural activities with the architectural community and with society at large, such as being able to comprehend and write effective reports, design documentation and make effective presentations. To develop an understanding of architectural language through manual and digital ways, in order to make working drawings and presentable sheets using different rendering modes.

**PLO 11** **Project Management:** An ability to demonstrate management skills and apply architectural principles to one's own work as a member and/or leader in a team and to manage projects in a multidisciplinary environment.

**PLO 12** **Lifelong Learning:** Ability to recognize the importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

**LA-305 GIS for Architects - I**

**INTRODUCTION TO GIS**

Credit hours: 2

Prerequisites: None

**Content List**

* Introduction, Definitions Components, Functional Subsystem, Raster Data Model, Vector Data Model, Attribute Data Model
* Data Acquisition Techniques, Data Resources, Data Capturing Techniques And Procedures
* Data Interoperability (Transferring Data to and From Different Software like ArcGIS, AutoCAD etc.)
* Remote Sensing as Data Source; Introduction to Remote Sensing and Image Processing
* Data Transformation, Visualization of Spatial Data in Desired Projections
* Cartography and Visualization: Map Elements, Symbols to Portray Points, Lines, Area and Volumes, Variables Visual Hierarchy, Map Scale And Spatial Details

**Practical**

* Introduction to GIS lab (hardware/software)
* Practical demonstration of raster/vector/attribute data preparation, entry and display
* Data capturing through various means
* Digitization, vector/raster conversion, data layer integrations, data visualization, map layouts
* Data classification and thematic mapping, handling topological errors
* Assignments on graphic scales

Map compilation; Scale enlargement and reduction.

* Study and interpretation of topographic sheets; Cadastral Maps (*Massavies and*, *Khasra* plans etc.).
* Image interpretation, False color composite, Visual Interpretation of satellite images and aerial photographs.
* Various sensors data comparison; Thermal Infrared Image interpretation.
* Introduction to image processing software e.g. ERDAS Imagine (display, Geo-linking, Zooming, Identification of targets etc.).
* Use of GPS in the field to locate points, polygons or lines.

**Proposed Teaching Methodology**

* Lecturing
* Written Assignments
* Field Visits for data capturing and verification
* Lab Work using GIS software

**Recommended Books**

1. Heywood, I., Cornelius, S. and Carver, S. (2006), *An introduction to Geographic Information System*, New York, Addison Wesley Longman.
2. Clarke, K. (2004), *Getting Started with Geographic Information System*, New York, Prentice Hall, ISBN – 1879102897.
3. Burrough, P., (2002), *Principles of Geographic Information Systems for Land Resources Management*, Oxford, Oxford University Press, ISBN – 0198233655.
4. Lo, C. P. and Yeung, A. K. W. (2002), *Concepts and Techniques of Geographic Information Systems*. Upper Saddle River, NJ, Prentice Hall.
5. Otto Huisman and Rolf A. de (2000), *Principles of Geographic Information Systems*, The Netherlands ITC, ISSN-978-90-6164-269-5.
6. ESRI, *Getting Started with ArcGIS*, Online Tutorial, USA.
7. Philis Dink, Map Work, London, 1980
8. Ribson, H. Elements of Practical Geography, John Wiley & Sons, New York, Latest Edition
9. Lillesand, T.M. & Kiefer, R. W., Remote Sensing and Image Interpretation, 5th edition, John Wiley & Sons, New York

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| **UNIVERSITY OF MANAGEMENT & TECHNOLOGY**SCHOOL OF ARCHITECTURE & PLANNINGlogoDEPARTMENT OF ARCHITECTURE LAND SCAPE ARCHITECTURE |
| **Program** | **Bachelor of Land Scape Architecture**  |
| **Course**  | **LA-305** **GIS FOR ARCHITECTS-1** |
| **Credit Hours** | 2+0 |
| **Lecture Schedule**  | **Friday 2:00-4:00** |
| **Prerequisites** | None |
| **Resource Person** | Ms Rummana Khan Sherwani |
| **Counseling Timing** | See office Window  |
| **Email** | Rumana.shirwani@umt.edu.pk |

**FOR THEORY**

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| --- | --- |
| Marks Evaluation | Marks in percentage |
| Quizzes | 5% |
| Assignments | 20% |
| Mid Term | 25% |
| Final exam | 50% |
| Total | **100%** |

**FOR CLASS ASSIGNMENTS**

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| --- | --- |
| Marks Evaluation | Marks in percentage |
| Concept Of GIS | 5% |
| Elements of A Map | 10% |
| Concept of GIS Software | 10% |
| Concept of Projection | 10% |
| Concept of Contours | 10% |
| Concept of Google Earth Map | 10% |
| Concept of an Image | 5% |
| Concept of Image rectification | 10% |
| Concept of Image Classification In Erdas Imagine | 15% |
| Complete Report Of Work | 5% |
| Viva | 10% |
| TOTAL | **100%** |

**COURSE CALENDER**

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| --- | --- | --- |
| **WEEK** | **TOPICS /ACTIVITY** | **Textbook (TB)/Reference (Ref) Readings**  |
| **WEEK-01** | Introduction to GIS, Practical application of Map making**Assignment:** Study Types of maps and mark its pros and cons with respect to Mapping. | Class Notes |
| **WEEK-02** | What is a map, What are essentials of map**Assignment:** Drawing a map of a country along with its basic elements | Class Notes |
| **WEEK-03** |  **Concepts of Scale:** Generate concept of scale.Scales; Representative Fraction, Graphic & Area Scale, Scale of Factor **Assignment:** Digitalization of Determination & Change of Map Scale**.** Differentiate Representative Fraction, Graphic & Area Scale, Scale of Factor |  |
| **WEEK-04** | * Determination & Change of Map Scale Map types with respect to Scale, Content and Presentation Techniques

 **Assignment: Map Reduction**  & **Map Enlargement**  | Class Notes |
| **WEEK-05** | **Coordinate Systems:** Mark Points on Google Earth | Class Notes |
| **WEEK-06** | Contours, Concept of Contours , Contour Plan**Class Practical:** Drawing a contour Plan with Elevation**Assignment:** What is a Contour? Determine different Types of Contours. Identify Contour Characteristics in detail along with sketches. (Hand written and individual Assignment) Projections: Types of Projection, Projection Concept**Guest Speaker** |  |
| **WEEK-07** | **Class Practical:** Universal Transverse Mercator Projection **Assignment:** What is Universal Transverse Mercator Projection? Determine different Types of Projections. Identify UTM Projection Characteristics in detail along with sketches.(Hand written and individual Assignment)  |  |
| **WEEK-09** | MID- TERM WEEK |  |
| **WEEK-10** | Introduction of Remote Sensing**Class Assignment:** Importance of Remote sensing Remote Sensing: History, Purpose, types and methods,  **Class Assignment:** write note on history of remote sensing  | Class Notes |
| **WEEK-11** | **Image Classification: Supervised Classification with imageries downloaded from the USGS Website, also Submission of Report and Relative Problem Solving** | Class Notes |
| **WEEK-12** |  **Importance of GPS device, Functions and characteristics****Class Assignment:** Types of GPS and their use **Field Assignment: Take readings of different petrol station during the way to khewra mines by using GPS and draw a route map,**  | Class Notes |
| **WEEK-13** | **Types of satellites, importance, their characteristics and functions****Class Assignment:** Differentiate any two satellites system and make the presentation**Practical:** **Mosaicking** | Class Notes |
| **WEEK-14** | Types of remote sensing **Class Assignment:** Getting pictures of any place by going different levels of a building and determining the impact of height while viewing of different objects and its impact on area coverage | Class Notes |
| **WEEK-15** | **Image Classification: Unsupervised Classification with imageries downloaded from the USGS Website, also Submission of Report and Relative Problem Solving** |  |
| **WEEK-16** | **FINAL VIVA** |  |

**RULES & REGULATIONS OF CLASS**

* Attendance would be marked in first 10-15 min of the class i-e till **2:15.**
* Participants are allowed to sit in the class if late, but are not allowed to claim for attendance.
* Attendance would be **canceled** if participants did not report to Resource Person after Field Survey.
* Participants would **not** be allowed to sit in **examination** in case of Short Attendance.
* **Daily progress** is marked in mapping so do report accordingly.
* **50% Marks deduction** in case of Late Submission and **No Late Submission** after 2 Days of Dead Line.