**University of Management and Technology**

**School of Architecture & Planning**

**Department of Architecture**

Course code: **AR-639** Course title: **Advanced Structural Systems**

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| Program | **M. Arch** |
| Credit Hours | **3+0** |
| Duration | One Semester( 16 weeks) |
| Prerequisites | Nil |
| Resource Person | As per timetable |
| Counseling Timing  (Room# 4L-9 ) | Kindly see office window |
| Contact | - |

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

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

**Learning Objective**

The objective of this course is to develop understanding about the architectonics: relationship between design, construction and structures. This course will create an understanding about different types of structural systems, building materials, construction detailing, and introduces appropriate techniques to students for the production of medium to large scale buildings

**Recommended Books and other related reading material:**

1. Building Structures Illustrated by Francis D.K.Ching
2. Building Construction Illustrated by Francis D.K.Ching
3. Construction materials, methods and techniques by William P. Spence and Eva Kultermann
4. Modern Construction Handbook by Andrew Watts
5. Structure and Architecture by Angus J.Macdonald
6. Structural Detail in concrete by M.Y.H Bangash
7. Barry’s Advanced Construction of Buildings by Stephen Emmitt ,‎ Christopher A. Gorse
8. Building Construction by Varghese, P.C.
9. Construction Technology 2 Industrial and commercial building by Riley, Mike and Alison
10. Building Construction Principles, materials and systems Mehta , Madan, Armpriest, Danie
11. Construction Practice by Cooke and Brain
12. Structural Design: A Practical Guide for Architects By Rod Underwood & Michele Chiuini
13. Professional Building Construction Directory 1994 by Professional Publishers
14. Structural basis of architecture by Bjorn N.Sandaker, Arne P.Eggen & Mark R.Cruvellier
15. Structure for architects and Engineers by Philip Garrison
16. The Architect’s Studio Companion by Edward Allen and Joseph Iano

**Reference Books:**

All books published during the last 10 years and also mentioned in the weekly calendar.

**Learning Methodology:**

The course is to be supported by classroom lectures, literature studies, case studies, presentations, term paper, and field/site visit to local sites.

**Grade Evaluation Criteria**

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| **Components** | **Marks**  **%** |
| Complex presentations/ progress reviews | 10 |
| Quizzes / Assignments | 15 |
| Mid Term Exam | 25 |
| Final Exam | 50 |
| Total | 100 |

**Calendar of Course contents to be covered during semester**

**Course code: AR639**

**Course title: HISTORY OF URBAN FORM**

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| **Week** | **Course Contents** | **Reference Chapter(s)** |
| 1 | Principles in Practice: Soil and excavation | Construction materials, methods and techniques by William P. Spence and Eva Kultermann |
| 2 | Architectonics: Tectonics in Architecture | Introducing Architectural Tectonics: Exploring the Intersection of Design and Construction by Chad Schwartz |
| 3 | Taxonomy of Architectonics  **Introduction to the Term Paper** |  |
| 4 | Analysis of structural systems used in buildings: Wood and Steel  **Assignment 1: Introduction** | Building Construction Principles, materials and systems by Diane Armpriest, Walter Scarborough, Madan Mehta |
| 6 | Analysis of structural systems used in buildings: Site-Cast and Precast Structural Systems | 1. Building Structures Illustrated by Francis D.K.Ching 2. Building Construction Illustrated by Francis D.K.Ching |
| 7 | Analysis of structural systems used in buildings: Steel Structural Systems | 1. Building Structures Illustrated by Francis D.K.Ching 2. Building Construction Illustrated by Francis D.K.Ching |
| 8 | Case Studies, Presentation and Discussion on different forms and types of building | Class Notes |
|  | **MID TERM EXAMINATION** | |
| 10 | **PRESENTATION 01**  **Presentation on progress of research on the Term Paper** | Class Lecture and instructions |
| 11 | **Material and Empathy: Superpower in Architecture**  **Feedback on learning and Questions/ Answers Session** | 1. Building Structures Illustrated by Francis D.K.Ching 2. Building Construction Illustrated by Francis D.K.Ching |
| 12 | Study of High tech buildings  **Assignment 2** | Ali, M.M.; Al-Kodmany, K. Structural Systems for Tall Buildings. *Encyclopedia* **2022**, *2*, 1260-1286. https://doi.org/10.3390/encyclopedia2030085 |
| 13 | Sustainable Structural systems | Structural sustainability of high performance buildings by Mir M. Ali & [P G Dimick](https://www.researchgate.net/scientific-contributions/PG-Dimick-2055446515?_sg%5B0%5D=-Q7uecAuTStZ6oNeNPISCpAlFIc_HhZKcyjIadqrjhuu2QLcDjS5U4Bex_J0GMoUs1rcRR0.BOeJnoeLYecKnsa3AD2REVXXhHaCeDjnSCRO5xfOm8Cf1Voz18bm6i3l3DccyhPXIjlYkBFvWrGzdAgPAOtKqg&_sg%5B1%5D=ttlsczK0QnOkzAmxzMsj1edleM8Ch03afJGyNAjc9IfRUYH2LeNTqNqaqSsTFKJjJHPzP_U.vVKXarwz_VIR5VTdiq2SaD9XGPTSphz5MlGIlBZ_m10W9nu-K2yrO0Q2FFiNAr4opnBfA3DhwK8GCaDL1nScXA) |
| 14 | Visit to different under construction sites  **Question- Answer Session on Assignment 2** | |

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| 15 | **PRESENTATION 02**  **Advanced Structural Systems**  **Submission of Term paper** | Class notes |
| 16 | **FINAL EXAMINATION** | |