**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.

|  |  |
| --- | --- |
| Program/Course Title | **AR-415: Environmental Control Systems-III**  |
| Credit Hours | **2+0** |
| Duration | Course Duration: 16 weeks/Fall 2022 [Offered to 4th. Year Students in 1st. Sem.] |
| Prerequisites | ECS – I & II |
| Resource Person | Zahid Tauqeer Ahmad - **SEC – A** Arsala Hashmi - **SEC – B** |
| Counseling Timing | To be decided  |
| Contact | zahid.tauqeer@umt.edu.pk**0300 – 4493820**arsala.hashmi@umt.edu.pk**0301- 4541681**  |

**Chairman/Director Program signature………………. Dean’s signature…………**

**Date: 6thoct. 2022**

**STUDIO POLICY:**

**APPLICABLE FROM 01 OCT 2022**

**FALL 2022 ON ALL BATCHES**

** Architecture Studios will practice code in order to ensure the respect of others in terms**

**of color, gender, religion, race and cadre and also to discourage cheating, lying, stealing**

**etc.**

** Students are instructed to come and leave the studio as per scheduled time and any**

**deviation prior to the studio instructor’s consent will not be entertained.**

** The studio and counseling hours schedule will be mentioned on course outlines and also**

**communicated through email.**

** All progress or other studio activity missed must be completed according to the terms**

**clarified by the individual instructor.**

** It is the responsibility of students, instructors and administrative staff to ensure studio**

**decorum, cleanliness and safety of equipment.**

** Every student can use the allocated space in studio comfortably with respect to his/her**

**surroundings in terms of sound levels, language and humor used etc.**

** Only authorized members (students, instructors and administrative staff) will be allowed**

**to enter the studio.**

** Architecture Studio instructors should establish the transparent assessment methods in**

**order to ensure quality and excellence.**

**Student Attendance and Process of Studio Work**

**1. The attendance is a serious concern in Architecture Studios. The students only adhering**

**to the following conditions will qualify for Final Examination.**

**2. A student is considered absent if he comes above 15 minutes late after the scheduled**

**time.**

**3. No student is exempted from submission of assignments and projects in any case. The**

**submission are considered Late if the following conditions apply.**

**a. Student must meet the deadline, specified by the teacher, for “Late Submission”.**

**For each Studio Project Work Maximum 6 absences are allowed**

**Minimum & Preferred Attendance Level 80%**

**b. A deduction of up to 10% (as decided by the resource person and batch advisor)**

**is applicable on the grades given in the case of all “Late Submissions”.**

**4. The hand drafting / manual drawings are mandatory for students up till 4th semester.**

**From 5 th semester onwards, preliminary work should be manual and mode of final presentation is digital.**

**Assessments and Evaluation Criteria**

**1. Two projects are given in a semester. Total 4 projects in a year.**

**2. In each studio, discussion and debate among students is generated. Each student is**

**required to bring innovative ideas of his/her own.**

**The following assessment and evaluation criteria for studio learning shall be followed:**

**Dimension Internal Evaluation External Jurors**

**Basic Studio – 1st Year 90% 10%**

**2 nd Year 80% 20%**

**3 rd Year 70% 30%**

**4 th Year 60% 40%**

**9th Semester 50% 50%**

**10th Semester 40% 60%**

**Requirements for promotion or repetition of failed course/s**

**To pass a precedent design studio course will be mandatory to be considered eligible for taking**

**up the design studio course in the next semester. The following policy will apply for promotion**

**in design studio courses:**

**1. Basic design studio - Architectural design studio-VI:**

**i) The student has passed the pre-requisite studio course.**

**2. Thesis Design:**

**i) The student has passed all the pre-requisite studio courses till eighth semester.**

**ii) He/ she has cleared all the theory courses till eighth semester.**

**Approved by:**

**CoD Architecture, SAP Dean SAP**

**Dr Sana Malik Dr Fariha Tariq**

**ATTENDANCE POLICY:**

**APPLICABLE FROM 01 OCT 2022**

**FALL 2022 ON ALL BATCHES**

**1. The student will be marked ABSENT whose portal is blocked due to fee or any other reason.**

**2. Students scoring less than 80% attendance will be marked S.A (SHORT ATTENDANCE) and will**

**be intimated before Mid and Final term examinations.**

**3. Participant leaving the mid/end term exams/assessment without approval shall result in the**

**award of an ‘F’ grade.**

**4. Students with previous F, SA or W grades will not be allowed to study subjects with time clash in**

**the next semester.**

**5. Students from gulf countries are allowed to go for Iqama renewal, as per UMT policy. The Iqama**

**renewal is possible 6 months in advance. Iqama renewal for expats is possible while they are**

**outside Saudi Arabia and UAE. No one will be accommodated at the eleventh hour.**

**6. Late arrivals are allowed only till 15 minutes. Afterwards the student will be graded absent for**

**the whole session.**

**7. Students with only 50% (or less) attendance, before midterm, will be graded as SA and will not**

**be allowed to sit in midterm exam. Especially for final year students who are attempting their**

**thesis project, they will not be allowed to display their project.**

**8. All medical issues will be referred to UMT Medical center, psychological issue to UMT clinical**

**psychology department for verification. The final decision will be by the teachers in charge as**

**following:**

**i) In case of prolonged health issues the student will be awarded W-GRADE.**

**ii) If any medical issue is faced just before the final exam, the student will be awarded I-**

**grade.**

**iii) Maternity cases are advised to freeze their semester till the Mid-term exam. They will**

**be graded I-GRADE if they apply after given Mids and before Finals.**

**Approved by:**

**CoD Architecture, SAP Dean SAP**

**INTERNSHIP POLICY:**

**APPLICABLE FROM 01 OCT 2022**

**FALL 2022 ON ALL BATCHES**

** Students enrolled in the 3 and 4rth year are entitled to undergo an internship**

**evaluation process at any point during the said time.**

** Students can use their personal sources or through OCLP and SAP for internships.**

** For Internships 6-8 weeks/ 3-6 Credit hours (20 hours minimum, per week) time is**

**mandatory with any reputed yet PCATP accredited Firm/ Architect having a minimum**

**experience of 10 years/ good 10 years standing with PCATP.**

** A minimum of 1500 words internship report is mandatory at the end of the Internship**

**by the student.**

** Students doing internship will get the benefit (IN any evaluation) upon satisfactory**

**performance on the Internship Evaluation Sheet/Report “duly signed by the firm head.**

** The department will mark the status of Internship form, with employer.**

**Approved by:**

**CoD Architecture, SAP Dean SAP**

**Dr Sana Malik Dr Fariha Tariq**

**AR-415: ENVIRONMENTAL CONTROL SYSTEMS-III**

**Credit Hours: 2+0**

**HEC Approved Course Summary:**

* Understanding of building as an energy system and environmentally responsive design
* Social, economic and ethical aspects of use of energy in buildings
* Understanding of different parameters of weather data
* Impact of buildings on the environment

**UMT Course Contents based on HEC summary:**

The course is divided under **FOUR** main headings as:

**A.** Environment and Natural Resources Management

**B.** Energy resources Management

**C.** HVAC – Heating, Ventilation & Air Conditioning

**D.** Fire Safety and Egress System in Buildings

**A. Environment and Natural Resources Management:**

* Land as a resource: Common property resources, Land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer-pesticide problems.
* Forest resources: Use and over-exploitation, Mining and dams-their effects on forest and tribal people
* Water resources: Use and over-utilization of surface and ground water, Floods, draughts, Water logging and salinity, Dams-benefits and costs.

**B. Energy resources:**

 Energy needs, Renewable and non-renewable energy sources, use of alternate energy sources, Impact of energy use on environment, Regulations concerning energy use, study of solar energy and its use, photo voltaic solar cells, wind energy, wave energy, tidal energy, hydro power, geothermal energy, bio-mass.

**C. Air Conditioning**

Definition of air conditioning and different methods of Zoning and HVAC systems, Fresh air intake / air cycles, humidifying and dehumidifying techniques, comfort zone diagram / charts, air-conditioning plants, their types, locations, size and space requirements for their installation’s Standards / Charts / Diagrams/*Heat Transfer Mechanism in Buildings* etc.

. Estimating Cooling and Heating loads in buildings as well as the methods of reducing these loads. Cooling towers, their installation requirements, supply and return air ducts, their layout, sizes at the near and far ends of the HVAC plant with and without false ceiling are explored, Chilled and hot water piping system, air dampers, registers/ diffusers, grills and fan coil units, An overview of Passive HVAC techniques as use of microclimatic techniques, Solariums, ‘Trombe Wall’, ‘Green Façade / Roof etc.

**D.** **Fire Safety and Egress System in Buildings:**

**The Most Common Types of Fire Suppression Systems**

* Water-Based Fire Suppression Systems. One of the most common types of fire protection systems uses water to knock out fires.
* Chemical Foam Suppression Systems.
* Pneumatic Heat Detection Tube.
* Pressurized Gas System.
* Foam Deluge Systems.

**Precautions against Fire**

1. Control smoking materials and open flames.
2. Store flammable and combustible liquids safely.
3. Use electrical equipment correctly.
4. Perform general housekeeping tasks on a regular basis.
5. Purchase fire-safe furnishings, decorations, and interior finishes.
6. Maintain commercial kitchen exhaust systems.

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

**PEO 1:** Ability to think creatively and identify new trends in Architectural design

**PEO 2:** Critical learning for a broad function in various areas of Architectural sciences including structural, mechanical, electrical, environmental, earthquake, and construction management

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

**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 1Architectural Knowledge:** An ability to apply knowledge of mathematics, science, architectural fundamentals and an architectural specialization to the solution of complex architectural problems.

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

**PLO 3Design/Development of Solutions:** An ability to design solutions for complex architecture 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 4Case study analysis:** An ability to investigate complex architecture problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.

**PLO 5Modern 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 6The 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 7Environment 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 8Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of architectural practice.

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

**PLO 10Communication:** 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 11Project 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 12Lifelong Learning:** Ability to recognize the importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

**Course Learning outcomes (CLO’s)**

After studying this course, the students will be able to better understand:

**CLO 1:** What are building systems including methods of construction, and environmental control systems? (C1)

**CLO 2:** Stimulate an awareness of Natural Resources Management. (C2)

**CLO 3:** Classify Renewable & Non-renewable Energy systems. (C3)

**CLO 4:**Select& apply various HVAC Systems appropriate to Building types (C4)

**CLO 5:** Inspect sustainable strategies and ecological issues related to carbon footprint and conservation of environment with respect to international practices. (C5)

**CLO 6:** Estimate heating & cooling loads by using the theoretical knowledge and thumb rules discussed and developing wall and roof sections w.r.t to R-values and U-values. (C6)

**CLO 7:** Develop design of HVAC system and firefighting systems of different buildings. (C7)

**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:** | **PLO3: Design/Development of Solutions Design/Development of Solutions Design/Development of Solutions Design/Development of Solutions** | **PLO 4: Case study analysis** | **PLO 5: Modern Tool Usage** | **PLO 6: The Architect and Society** | **PLO 7: Environment and Sustainability** | **PLO 8: Ethics** | **PLO 9: Individual and Team Work** | **PLO 10: Communication** | **PLO 11: Project Management** | **PLO 12: Lifelong Learning** |
| **7THSEMESTER** | **AR-415** | **ENVIRONMENT CONTROL SYSTEMS-III** | What are building systems including methods of construction, and environmental control systems? (C1) | √ |  |  |  |  |  |  |  |  |  |  | √ |
| Stimulate an awareness of Natural Resources Management. (C2) | √ |  |  |  |  | √ |  |  |  |  | √ | √ |
| Classify Renewable & Non-renewable Energy systems. (C2) |  |  |  |  |  | √ | √ | √ |  |  |  |  |
| Select & apply various HVAC Systems appropriate to Building types (C3) |  | √ | √ |  |  |  |  |  |  |  |  | √ |
| Inspect sustainable strategies and ecological issues related to carbon footprint and conservation of environment with respect to international practices. (C4) |  |  |  | √ |  | √ | √ | √ |  |  | √ | √ |
|  |  |  | Estimate heating & cooling loads by using the theoretical knowledge and thumb rules discussed and developing wall and roof sections w.r.t to R-values and U-values. (C5) |  |  | √ | √ |  |  |  |  |  |  | √ | √ |
|  |  |  | Develop design of HVAC system and firefighting systems of different buildings. (C6) | √ |  | √ |  |  |  | √ |  |  |  | √ | √ |

**Grade Evaluation Criteria**

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

**Activities Marks in %**

Assignments 5%

Case Study/Project 10%

4-5 Quiz 10%

**Mid Term 25%**

**Final exam 50%**

**Total 100%**

**Reference Books and Web Links**

1. Alternative energy systems in building design by Gevorkian, Peter, 720.472 GEV-A, 2010, Mcgraw hill
2. Glass house:building for open living by Adams, Nicky721.04496 ADA-G594912009, Thames and Hudson
3. The elements of architecture: Principles of environmental Drake, Scott720.47 DRA-E766, 382009, Edward Arnold
4. Time-saver standards for building types: DE Chiara, Joseph,721.0218 TIM, 60095, 2001, McGraw-Hill
5. Low impact building, 82675+B208
6. Climate responsive architecture, 2001, 720.472 CLI
7. Green walls green roofs: designing sustainable architecture, 109053, 2014
8. Energy manual sustainable architecture, 61977, Hegger, Manfred, 2008, R 720.47 ENE
9. Architecture, Comfort& Energy by C. Gallo, M. Sala, A.A.M. Sayigh, 1988
10. Architecture in a Climate of Change, A guide to sustainable design by Peter F. Smith **[soft copy available]**
11. Air Conditioning Principles and systems: An Energy Approach by Edward G.pita**[soft copy available/available in library]**
12. Heating ventilating, and air conditioning analysis and design, by McQuiston, Faye C; Parker, Jerald D; Spitler, Jeffrey D. –**[available in library]**
13. Principles of heating, ventilation, and air conditioning in buildings, by Mitchell, John W; Braun, James E- **[available in library]**
14. Comprehensive HVAC system design: a handbook on practical approach to air conditioning, heating and ventilation systems, by Gupta, N.C. **[available in library]**
15. **Green Building** – Guidebook for Sustainable Architecture.
16. How Buildings Work by EDWARD ALLEN **[soft copy available]**
17. Architects Data by Neuferts
18. Graphic Standards by Ramsey & Sleeper
19. <https://www.youtube.com/watch?v=VJX0LyxRV0E>
20. <https://www.youtube.com/watch?v=c3IieMtRMUQ>
21. <https://youtu.be/ScVBPAitibQ>
22. <https://youtu.be/Lz7a0VFDMYE>
23. <https://youtu.be/VK3nAXnWKdo>
24. <https://youtu.be/13W3UrWNI1Y>
25. <https://youtu.be/Ia1DuP4P6UA>
26. <https://youtu.be/fCH74Nq91Sw>
27. <https://youtu.be/Ic5a9E2ykjo>
28. <https://youtu.be/KCiv8IAUkh8>
29. <https://youtu.be/5y_VBiTiuAY>
30. <https://youtu.be/UmWWZdJR1hQ>

**Weekly schedule of Activities**

|  |  |  |
| --- | --- | --- |
|  **Week** | **Class Activity/Lectures** | **Reference books** |
| **Week 1-2** | General introduction to class rules/discipline, Grading Policy and course contents. **A. Environment and Natural Resources Management*** The course starts with Land as a resource: Different Land Forms, Fertile Land and Land degradation, Soil erosion and desertification, Effects of modern agriculture, fertilizer-pesticide problems. Effect of Urban Sprawl on Land.
* Forest resources: Use and over-exploitation, Mining and dams-their effects on forest and tribal people
* Water resources: Use and over-utilization of surface and ground water, Floods, draughts, Water logging and salinity, Dams-benefits and costs.

 **ASSIGNMENT-I– Glossary of most commonly used Terms / Concepts [min. 50] in Natural Resources Management** | Class Discussion/ NotesEnergy manual sustainable architecture, 61977, Hegger, Manfred, 2008, R 720.47 ENE.Green walls green roofs: designing sustainable architecture.Alternative energy systems in building design by Gevorkian, Peter, 720.472 GEV-A, 2010, McGraw hill.**Green Building** – Guidebook for Sustainable Architecture. |
| **Week 3** | **B. Energy resources:*** Energy needs, Study and Analysis of Renewable and non-renewable energy sources, Impact of energy use on Environment, Regulations concerning energy use.
* **Quiz- I**
 | Class Discussion/ NotesEnergy manual sustainable architecture, 61977, Hegger, Manfred, 2008, R 720.47 ENE.Alternative energy systems in building design by Gevorkian, Peter, 720.472 GEV-A, 2010, McGraw hill.**Green Building** – Guidebook for Sustainable Architecture. |
| **Week 4** | * Study of solar energy and its use, photo voltaic solar cells, wind energy, wave energy, tidal energy, hydro power, geothermal energy, bio-mass.

**Guest Lecture** [Postponed]* **ASSIGNMENT-II:Study and Analyze** **sustainable strategies and ecological issues related to carbon footprint and conservation of environment with respect to international practices.**
 | Class Discussion/ Notes**Green Building** – Guidebook for Sustainable Architecture.Energy manual sustainable architecture, 61977, Hegger, Manfred, 2008, R 720.47 ENE.Alternative energy systems in building design by Gevorkian, Peter, 720.472 GEV-A, 2010, McGraw hill. |
| **Week 5-6** | * **Submission of Assignment-II**

Basic introduction to LEEDS.**C. Heating, Ventilation &Air Conditioning** * The section starts with Difference btw climate and weather. Different climatic zones will be discussed. Study of Comfort chart, Comfort zone diagram as well as
* Familiarization to and understanding of the HVAC technology, Study and Analysis of Heat Transfer Mechanism in Buildings, ASHRAE Standards / Charts / Diagrams/ etc.
* An overview of Passive HVAC techniques e.g., use of microclimatic techniques, Solariums, ‘Trombe Wall’, ‘Green Façade / Roof etc.
* **QUIZ-II**
* **ASSIGNMENT-III – Study/Analysis & Collection of basic relevant Data from ASHRAE Tables**

**Case Study No. 1-Introduction – ‘Study and analysis of a Small space (a retail outlet, a residential space having 2-3 rooms, A small consultancy office space etc.) with respect to its size, HVAC system, openings, wall and roof section, R-values, U-values etc.****Guest Lecture 1– ‘Thermal Behavior of Building and the concept of HVAC’- The Basics.** | Class Discussion/ Notes.Architecture in a Climate of Change, A guide to sustainable design by Peter F. Smith Air Conditioning Principles and systems: An Energy Approach by Edward G.pita.Alternative energy systems in building design by Gevorkian, Peter, 720.472 GEV-A, 2010, McGraw hillGreen walls green roofs: designing sustainable architecture |
| **Week 7** | * Estimating Cooling and Heating loads in buildings as well as methods of reducing these loads.
* Study and Analysis of various Central HVAC systems, Air cycle/Changes, humidifying and dehumidifying techniques.
* **SUBMISSION ASSIGNMENT - III**
* **QUIZ-II,**

**Case Study No. 1- Submission of plan,** **estimating heating & cooling loads by using the theoretical knowledge and thumb rules discussed and developing wall and roof sections w.r.t to R-values and U-values.** | Class Discussion/ NotesAir Conditioning Principles and systems: An Energy Approach by Edward G.pita. |
| **Week 8** | * **Guest Lecture 2 – ‘Study and Analysis and selection of various HVAC Systems appropriate to Building types’**

**Case Study No. 1 – Submission of**  | Class Discussion/ NotesAir Conditioning Principles and systems: An Energy Approach by Edward G.pita. |
| **WEEK 9** | **MID TERM EXAM** |
| **Week 10-11** | * Different type and components of air conditioning and HVAC systems.
* Air Handling Units [AHU] - Types, Location, size and space requirements / Characteristics for their installation.
* Cooling Towers - Installation requirements, Chilled and hot water piping system, air dampers, registers/ diffusers, grills and FCUs [fan coil units].

**Case Study No. 2 – [Introduction Planning and** **designing of HVAC SYSTEM 1st Design Project]** | Class Discussion/ NotesPrinciples of heating, ventilation, and air-conditioning in buildings, by Mitchell, John W; Braun, James E.Comprehensive HVAC system design: a handbook on practical approach to air-conditioning, heating and ventilation systems, by Gupta , N.C. |
| **Week 12** | * Study of HVAC ducting system
* Supply and Return air ducts, their layout, sizes at the near and far ends of the HVAC plant with or without false ceiling.
* **QUIZ-III,**

**Case Study No. 2 – Submission** | Class Discussion/ NotesComprehensive HVAC system design: a handbook on practical approach to air-conditioning, heating and ventilation systems, by Gupta , N.C.Sir Conditioning Principles and systems: An Energy Approach by Edward G.pita. |
| **Week 13** | * Study of Fire Fighting system & fire escape requirements/ standards
* Fire Protection Requirements for Larger and TallerBuildings, Basic aspects to ensure safety of building occupants
* **ASSIGNMENT -IV:(Safety Precautionary Measures to be taken to prevent Fire Outbreak in a multi storeyedbuilding)**
* **Case Study No. 3– Introduction [Designing &Integration of acquired Fire Fighting knowledge/Skill to a “2nd Design Project with focus on fire safety measures]**
 | Class Discussion/ NotesHow Buildings Work by EDWARD ALLENThe elements of architecture: Principles of environmental Drake, Scott720.47 DRA-E766, 382009, Edward Arnold. |
| **Week 14** | * Study of international building codes and building classification w.r.t international fire safety standards.
* **SUBMISSION ASSIGNMENT - III**
* **Case Study No. 3– Discussion on plans and propoal [Designing & Integration of acquired Fire Fighting knowledge/Skill to a “2nd Design Project with focus on fire safety measures]**
 | Class Discussion/ NotesHow Buildings Work by EDWARD ALLENThe elements of architecture: Principles of environmental Drake, Scott720.47 DRA-E766, 382009, Edward Arnold. |
| **Week 15** | * Course Revision
* **Guest Lecture 3 – ‘Key things to be understood while designing Fire Safety Systems in the building’**
* **QUIZ-IV**

**Case Study No. 3 - Submission** | Class Discussion/ NotesHow Buildings Work by EDWARD ALLENThe elements of architecture: Principles of environmental Drake, Scott720.47 DRA-E766, 382009, Edward Arnold. |
| **WEEK 16** | **FINAL EXAMS & GOOD LUCK** |