

Jamia Millia Islamia was established responding to Gandhiji's call to boycott all educational institutions supported or run by the colonial regime, a group of nationalist teachers and students quit Aligarh Muslim University, protesting against its pro-British inclinations. The university started from the Tibbiya College Campus at Karol Bagh and then moved to its present location. The growth of the university is a saga of dedication, conviction and vision of a people who worked against all odds and saw it growing step by step.

The Faculty of Architecture and Ekistics at Jamia Millia Islamia was established in 2001 and is committed to the cause of "Social concern and Innovation". The Department of Architecture has several innovative Post Graduate programs catering to the demands of the society. The Masters in Architecture (Healthcare Architecture) is offered to cater to the enormous demand of healthcare infrastructure in our billion plus country. The program through its initiative of Architecture for Masses adopts the same approach of Healthcare for Masses. The program is dynamic and has components which are in sync with the contemporary demands of both the National and Global industry.

W.H.O states that *health is a state of complete physical, mental, and social well being, and not merely the absence of disease or infirmity*. This becomes more important and valid for India with its huge demographic dividend, spread across all the age groups. There is incredible need for additional contemporary healthcare facilities in Indian scenario. We need to provide the requisite healthcare infrastructure at all levels – be it villages, cities or the metropolises, catering to everyone and resilient towards all the challenges and disasters.

The M. Arch Healthcare Architecture program caters to the increasing demand of the health care industry which has been experiencing metamorphic changes because of technological advancement and introduction of new medical practices. Hospitals are changing their shape, size and even functions to adopt the advancement in the medical field. The objective of the program is to impart modern concepts in planning, designing, equipping and commissioning of all such built environments which are associated with the health care industry. The program focuses on all the modern trends and future aspects of planning health care facilities and services.

The course curriculum of M. Arch Healthcare architecture was first revised in July 2019. Now this is the second syllabus revision. The new revised semester themes are as below:

1. Semester I: Orientation & Research
2. Semester II: Value Addition & Specialized Services
3. Semester III: Services, Interiors & Global Scenario
4. Semester IV: Interpretation and Innovation of Practice & Theory

**FACULTY OF ARCHITECTURE & EKISTICS**  
**DEPARTMENT OF ARCHITECTURE**  
**JAMIA MILLIA ISLAMIA**

**M. ARCH (HEALTHCARE ARCHITECTURE)**  
**SCHEME OF EXAMINATION**

**SEMESTER -1**

w.e.f March 2024

Session 2024-25

| CODE    | SUBJECT                              | CLASSES |       | MARKS |     |     |       | EXAMS<br>(HOURS) | CREDIT |
|---------|--------------------------------------|---------|-------|-------|-----|-----|-------|------------------|--------|
|         |                                      | LECTURE | T/ ST | IA    | WR  | VV  | TOTAL |                  |        |
| MHA-101 | HealthcareArchitecture<br>Philosophy | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-102 | Research Methodology                 | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-103 | Healthcare Planning-I                | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-104 | Resilient Hospital Architecture      | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-105 | Hospital Services- I                 | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-106 | Studio- I                            | 2       | 6     | 100   | -   | 100 | 200   | -                | 8      |
| MHA-107 | Elective-I                           | 2       | 2     | 50    | -   | 50  | 100   | 3                | 4      |
| TOTAL   |                                      | 14      | 14    | 350   | 200 | 150 | 700   | -                | 28     |

**SEMESTER -2**

| CODE    | SUBJECT                                | CLASSES |       | MARKS |     |     |       | EXAMS<br>(HOURS) | CREDIT |
|---------|----------------------------------------|---------|-------|-------|-----|-----|-------|------------------|--------|
|         |                                        | LECTURE | T/ ST | IA    | WR  | VV  | TOTAL |                  |        |
| MHA-201 | Healthcare policies and<br>legislation | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-202 | Healthcare Administration              | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-203 | HealthcarePlanning-II                  | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-204 | BIM &Energy Simulation                 | 2       | 2     | 50    | -   | 50  | 100   | 3                | 4      |
| MHA-205 | Hospital Services- II                  | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-206 | Studio-II                              | 2       | 6     | 100   | -   | 100 | 200   | -                | 8      |
| MHA-207 | Dissertation                           | 2       | 2     | 50    | -   | 50  | 100   | -                | 4      |
| TOTAL   |                                        | 14      | 14    | 350   | 150 | 200 | 700   | -                | 28     |

**SEMESTER -3**

| CODE    | SUBJECT                                                 | CLASSES |       | MARKS |     |     |       | EXAMS<br>(HOURS) | CREDIT |
|---------|---------------------------------------------------------|---------|-------|-------|-----|-----|-------|------------------|--------|
|         |                                                         | LECTURE | T/ ST | IA    | WR  | VV  | TOTAL |                  |        |
| MHA-301 | Healthcare Finance                                      | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-302 | Health care services: global opportunities and strategy | 2       | 0     | 25    | 25  | -   | 50    | 3                | 2      |
| MHA-303 | HealthcarePlanning-III                                  | 2       | 2     | 50    | 50  | -   | 100   | -                | 4      |
| MHA-304 | Hospital Interior Design                                | 2       | 2     | 50    | -   | 50  | 100   | -                | 4      |
| MHA-305 | Hospital Services- III                                  | 2       | 2     | 50    | 50  | -   | 100   | 3                | 4      |
| MHA-306 | Studio-III                                              | 2       | 6     | 100   | -   | 100 | 200   | 3                | 8      |
| MHA-307 | Elective-II                                             | 2       | 2     | 50    | -   | 50  | 100   | -                | 4      |
| TOTAL   |                                                         | 14      | 14    | 350   | 150 | 200 | 700   | -                | 28     |

**SEMESTER -4**

| CODE    | SUBJECT                                           | CLASSES |       | MARKS |    |     |       | EXAMS<br>(HOURS) | CREDIT |
|---------|---------------------------------------------------|---------|-------|-------|----|-----|-------|------------------|--------|
|         |                                                   | LECTURE | T/ ST | IA    | WR | VV  | TOTAL |                  |        |
| MHA-401 | Project Management                                | 2       | 2     | 50    | 50 | -   | 100   | 3                | 4      |
| MHA-402 | Thesis                                            | 2       | 14    | 200   | -  | 200 | 400   | -                | 16     |
| MHA-403 | Innovations & Research in Healthcare Architecture | 2       | 6     | 100   | -  | 100 | 200   | -                | 8      |
| TOTAL   |                                                   | 6       | 22    | 350   | 50 | 300 | 700   | -                | 28     |

**Abbreviations followed**

T - Tutorial

ST - Studio

IA - Internal Assessment

WR - Written Exam

VV - Viva Voce

## MHA-101: HEALTHCARE ARCHITECTURE PHILOSOPHY

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 0    | 2     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 25 | 25 | -  | 50    | 2      |

### OBJECTIVE:

- To make a base of sound understanding of fundamentals and dynamics of Healthcare philosophy and theories in healthcare Architecture.
- To critically analyze the ongoing modern Philosophy of Architecture practices in the Indian scenario and its impact on healthcare facilities.

### METHODOLOGY:

- Lectures and presentations based on field observations, surveys and library studies.

### CONTENTS:

- Philosophy of Human Well-being through Architecture.
- Relation between Architecture & Philosophy.
- The Power of Architecture.
- Architecture and Healing.
- Traditional Indian healing gardens.
- Analytical approach of healthcare Architecture.
- History, Theory, Criticism, Post Mortem and Anti Mortem.
- Time, Function and Alterity in Healthcare Architecture.
- Complexity and Contradiction in Healthcare Architecture
- Healthcare Architectural Theory and Practice in International and Indian Context.
- Healthcare Architectural Development in International and Indian Context: 21<sup>st</sup> century Changes with Digital India.
- Ethics of Healthcare Architecture – Objectivism

### READINGS:

- Complexity and Contradiction in Architecture by Robert Venturi
- Primary care centres, A guide to health care design by Geoffrey Purves
- Architectural Philosophy: Repetition, Function, Alterity by Andrew E. Benjamin
- Architectural Reflections: Studies in Philosophy and Practice of Architecture By Colin St. John Wilson, Roger
- Modern Architectural Theory by Harry Mallgrave

## MHA-102: RESEARCH METHODOLOGY

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 | -  | 100   | 4      |

### OBJECTIVE:

To enhance the students' generic research, communication skills and critical analytical ability complemented by specialized subject-specific research which shall provide the foundation for the postgraduate program.

### METHODOLOGY:

Lectures, Seminars, Workshops, Project work and tutorials.

### CONTENTS:

**Unit I:** An Introduction to Research Methodology- hypotheses, Null Hypothesis, Types of Research Foundation: Its Nature and Scope, plagiarism. Scientific Research, Action Research, Pure and Applied Research in Architecture, Research Ethics.

**Unit II:** Research Methods: Historical, Survey, Experimental, Case Study, Ethnographic, Visual Research, Research instruments used in the quantitative and qualitative modes of data collection.

**Unit III:** Data Collection strategies/ techniques and ethical considerations. Tools and Techniques of Research: Characteristics of Good Tools, Questionnaire and Interview, Observation, Tests, Scale and Types

**Unit IV:** Descriptive Statistics: Data: Nature and types, Normal Probability Curve: Skewness and Kurtosis Measures of Central tendencies, Measure of Variability, Measures of Correlation: Pearson's correlation and Spearman's Rho

**Unit V:** Preparation of Research Proposal, Objectives, Research Questions, Hypothesis, Review of Related Literature, Analysis of Research paper, Dissertation and Thesis writing techniques in Architecture.

### Expected Outcome:

A 2000-1500 words research article on various theories and design philosophies on healthcare design, after reading 10-15 research papers. The write-up should have proper in-text citations and referencing.

## MHA-103: HEALTHCARE PLANNING-I

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 | -  | 100   | 4      |

### OBJECTIVE:

- To make a base of sound understanding of hospital departments/ primary healthcare centres/ small clinical facilities.
- To critically analyze the planning fundamentals and design dynamics of hospital departments and small clinics.

### METHODOLOGY:

- Lectures and Site visits/educational trips for field observations, surveys and library studies.

### CONTENTS

#### Public health and its program development

- Different programs of public health.
- Essential services for public health systems
- Emerging scope of public health components.
- Documentation & presentation of public health facility scenarios in different regions of India.

#### PHC's and Hospital Departments

- Hierarchy of healthcare facilities as sub-centres, PHC, CHC
- Introduction to hospital departments
- Planning & designing layouts.
- Healthcare equipments/Machines in small healthcare facilities

### OUTPUT:

- The output should be presented at the end of the semester in the form of a detailed architectural review report of primary healthcare centres from various regions of India.

## MHA-104: RESILIENT HOSPITAL ARCHITECTURE

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
|---|------|-------|

|   |   |   |
|---|---|---|
| 2 | 0 | 2 |
|---|---|---|

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
|----|----|----|-------|--------|

|    |    |   |    |   |
|----|----|---|----|---|
| 25 | 25 | - | 50 | 2 |
|----|----|---|----|---|

### OBJECTIVE:

- To be able to understand the fundamentals of Hospital disasters and hospital safety and risk issues.
- To be able to understand the fundamentals of resilient Architecture and its implementation.

### METHODOLOGY:

- This is a research exercise where students will choose a topic and will study its various aspects as per the scope of the research.
- Discussions with the supervisor and site visits as required.

### CONTENT:

#### HOSPITAL DISASTERS

- Threat analysis and Specialised cases of healthcare facilities
- Opportunities available and management plan
- Resource mobilisation: space, money, manpower, equipment
- Role of Social Organisations
- Role and behaviour of healthcare care facilities during various disasters such as floods, Earthquake, Cyclones, Tsunamis, Forest fires and Pandemics

#### Resilient Architecture

- EIA and disaster management of hospitals
- Safety issues of hospitals
- Risk assessment and Resilience theory
- National and international resilience techniques
- Hospital safety standards
- Patient safety and QRT
- Resilient Architecture elements and Adaptive resilient features
- Disaster Expansion Facilities

### OUTPUT:

- Report to be submitted at the end of the semester comprising the Study and conclusions/proposals/guidelines based on the reconnaissance.

### READINGS:

- Disaster Management: Enabling Resilience by Anthony Masys
- Building A Resilient Tomorrow: How To Prepare For The Coming Climate Disruption by Hill, Oxford UP
- Coalition of Disaster Resilient Infrastructure (CDRI) manual.

## MHA-105: HOSPITAL SERVICES - I

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 | -  | 100   | 4      |

### OBJECTIVE:

- To introduce the students to the theory and practice of the latest hospital services (Clinical & non-clinical) and their impact on the planning and design of healthcare Architecture.

### METHODOLOGY:

- Classroom teaching through lectures and presentations.
- Conducting exercises on live studies, Visiting Hospitals and documentation of commercial Integrated Services.

### CONTENTS:

- HVAC Services: Basics of air conditioning, air condition working, HVAC Comfort principles, HVAC Components and systems.
- Electrical Services: In coming supply and distribution in buildings, Electric safety and risk assessment, Concept of fault level, Over current protection
- Fire Services: Basic fire extinguishing systems viz Water-based, pedestal fire hydrant systems, total flood gas protection systems, smoke management systems etc.
- Lighting Services: Photometry and colourimetry, lighting equipment and systems, lighting calculations, daylighting.
- Building Acoustics: Acoustics fundamentals, Acoustics design and planning, vibration
- Basic principles involved in the design of Plumbing services, Solar Water Heating, Rainwater harvesting etc.
- Medico engineering: Services like laundry, CSSD, Medical Gases, Autoclaving, Incinerator, ETP
- Electronic services: Networking, EAPBX, CCTV, Access control

## MHA-106: STUDIO- I

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 6    | 8     |

### EXAMINATION MARKS

| IA  | WR | VV  | TOTAL | CREDIT |
|-----|----|-----|-------|--------|
| 100 | -  | 100 | 200   | 8      |

### OBJECTIVE:

- Exploring and designing small-scale healthcare facilities (Sub centres, Primary healthcare centres, community healthcare centres).

### METHODOLOGY:

- Studio Exercise.
- Documentation & presentation of health facility scenario.
- Case studies to be clubbed with library research.
- Conceptual design scheme

### CONTENTS

The studio exercise should focus on the study and designing of healthcare facilities on a small scale starting from sub-centres, Primary healthcare centres and community healthcare centres up to a small hospital. The project may include 30-50 beds in general hospitals.

### OUTPUT:

- The output should be a well-designed 30-50 bed general hospital with a complete set of drawings.

## **MHA-107: ELECTIVE-I**

### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### **EXAMINATION MARKS**

| IA | WR   | VV | TOTAL | CREDIT |
|----|------|----|-------|--------|
| 50 | .... | 50 | 100   | 4      |

### **OBJECTIVE:**

- To be able to understand the fundamentals of healthcare institutions with the latest concepts and their incorporation through innovation in the healthcare architecture.

### **METHODOLOGY:**

- This is a research exercise where students will choose a topic and will study its various aspects as per the scope of the research.
- Discussions with the supervisor and site visits as required.

### **CONTENT:**

- Contemporary Technology.
- Integrated building services.
- EIA & Natural Resources.
- Ecology & Environment.
- Adaptive reuse in healthcare Architecture.
- Artificial intelligence and robotics in healthcare Architecture.
- Equipment Planning in Hospital Architecture.

### **OUTPUT:**

- The Elective report is to be submitted at the end of the semester and should be communicated in any peer-reviewed journal/refereed journal.

## MHA-201: HEALTHCARE POLICIES AND LEGISLATION

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 0    | 2     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 25 | 25 | -  | 50    | 2      |

### OBJECTIVE:

- To develop an understanding of policies & legislation related to the healthcare sector.

### METHODOLOGY:

- Lectures and presentations based on field observations, surveys, web searches and library studies.

### CONTENTS:

- Health law and policies
- Health Policies at various levels i.e. village, district, state and national level.
- Hospital accreditations – NABL, NABH, QCI
- Health care indicators
- Study of the requirements for the establishment of various hospitals and medical colleges.
- National & International Guidelines & Standards for General Hospital & Medical College: Is Codes, BIS, IPHS, WHO, UNICEF, Joint Commission, MCI, etc.
- Quality and accreditation-based bodies: ISQUa- International Society for Quality in Healthcare, NABH- National Accreditation Boards of Hospitals & Healthcare
- Bio-medical waste management and handling rules
- CPCB ( Central Pollution Control Board) guidelines
- Safe disposal of radio-active waste Rules 1995, guidelines of BARC.
- Role of Hospitals in Environmental pollution and Environmental impact assessment

## MHA-202: HEALTHCARE ADMINISTRATION

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 0    | 2     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 25 | 25 | -  | 50    | 2      |

### OBJECTIVE:

- Understand hospital management and administration system from day-to-day function to the whole life cycle of healthcare facilities.

### METHODOLOGY:

- Lectures and presentations based on field observations and secondary resources.

### CONTENTS:

#### Hospital Administration

- Application of Principles of Hospital Administration to Hospital and Healthcare Buildings (It will include all patient facilitation services)
- Application of Principles of Nursing to Hospital and Healthcare Buildings
- Application of Structure of Manpower to Hospital and Healthcare Buildings
- Hospital Supply chain management, Hospital Finance, Hospital Marketing
- HIS and Application of Principles of Healthcare Information Technology (HIT)
- Corporate governance
- Operation management
- Business plan
- Clinical and non-clinical management
- Ethics and values
- Data Management Services including Health Data Exchange
- Audio-video Telemedicine, Medical Conferences, Medical Call Centres

#### Planning and designing of Administrative services

- Executive Suite
- Professional Service Unit
- Financial Management Unit
- Hospital Information System
- Medical Records
- Nursing Services Administration Unit
- Human Resource Development

## MHA-203: HEALTHCARE PLANNING-II

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 |    | 100   | 4      |

### OBJECTIVE:

- To develop a basic understanding of clinical systems and departments of healthcare facilities of secondary and tertiary care.

### METHODOLOGY:

- Lectures introducing various concepts of healthcare facilities.

### CONTENTS

- Master Planning and Planning for Phasing of Physical Facility
- Universal Design for different types of Hospitals and Healthcare Buildings
- Modular Design of Healthcare Facilities
- Intensive Care Units of various types
- Intermediate Care Units of various types
- Emergency & Critical Care Facilities
- Trauma Care Facilities
- Hospital Traffic Management Systems including Intramural Patient Transport Systems and Ambulance Systems
- Outpatient Facilities
- Obstetric Suite, LDR & LDRP Rooms
- Imaging Suite including MRI, Ultrasound, Diagnostic
- Hospital Laboratories
- Blood Bank Services
- Interiors for Healthcare and Hospital Buildings
- Standard and Special Finishes for Healthcare Delivery Areas

## MHA-204: BIM & ENERGY SIMULATION

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
|---|------|-------|

|   |   |   |
|---|---|---|
| 2 | 2 | 4 |
|---|---|---|

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
|----|----|----|-------|--------|

|    |   |    |     |   |
|----|---|----|-----|---|
| 50 | - | 50 | 100 | 4 |
|----|---|----|-----|---|

### OBJECTIVE:

To inform the students about the importance of energy efficiency and its conservation in healthcare structures.

To learn the basic techniques and processes involved in Energy Efficiency and Energy Conservation through various techniques. The study and application of various software involved in the process.

### METHODOLOGY:

The methodology of imparting information should be lectures and presentations citing examples and case studies.

### CONTENTS:

- **Introduction**
- LEED
- Benefits and Advantages
- Incentive Programs
- Certification
- Professional Accreditation

#### **Green Building Concept**

- Indian Green Building Council o Concepts of Green Building
- Case Study of Green Buildings
- Energy and Resource-saving through Green Buildings
- Role of TERI

#### **Energy Conservation Building code ECBC**

- Role of the Bureau of Energy Efficiency BEE in Controlling Energy Scenario in India
- Application of ECBC in Indian Buildings
- Analysis of saving of Energy by the application of ECBC

#### **Application of Software**

- Introduction of Important Software in Energy Modelling of Buildings
- Application of Visual DOE in Modelling any one building

### OUTPUT:

- The output will be a portfolio which includes the application of BIM and Energy simulation on the final Studio-II exercise.

## MHA-205: HOSPITAL SERVICES - II

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 | -  | 100   | 4      |

### OBJECTIVE:

- To introduce the students to the theory and practice of the latest hospital services (Clinical & non-clinical) and their impact on the planning and design of healthcare Architecture.

### METHODOLOGY:

- Classroom teaching through lectures and presentations.
- Conducting exercises on live studies, Visiting Hospitals and documentation of commercial Integrated Services.

### CONTENTS:

- Design Parameters for Coordination and Integration of MEP and Fire Safety Services, both Intra Mural & Extra Mural Services.
- Concept of Centralisation and de-centralisation of Building Services in a Hospital.
- Hospital services as aesthetical elements.
- The life cycle of hospital building services systems.
- The calculation and costing of hospital building services systems.
- HVAC Services: Advance systems and latest innovations.
- Electrical Services: Advance systems and latest innovations.
- Fire Services: Advance systems and latest innovations.
- Lighting Services: Advance systems and latest innovations.
- Building Acoustics: Advance systems and latest innovations.
- Medico engineering: Advance systems and latest innovations.
- Electronic services: Advance systems and latest innovations.

## MHA-206: STUDIO- II

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 6    | 8     |

### EXAMINATION MARKS

| IA  | WR | VV  | TOTAL | CREDIT |
|-----|----|-----|-------|--------|
| 100 | -  | 100 | 200   | 8      |

### OBJECTIVE:

- Exploring and designing specialised hospitals which may be medium and large scale health-care facilities.

### METHODOLOGY:

- Studio Exercise.
- Case studies & Documentation of health care facility.
- Conceptual design scheme

### CONTENTS

The studio exercise should focus on the designing of specialized healthcare facilities of medium and large scale. The scale may vary from 100- 250 beds. These may include general hospitals, and specialized hospitals such as cardiac hospitals, oncology, paediatrics, gastroenterology, nephrology, maternity hospital etc.

### OUTPUT:

- The output should be a well-designed 100-250 bed general hospital or specialised hospital with a complete set of drawings and Model.

## MHA-207: DISSERTATION

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR   | VV | TOTAL | CREDIT |
|----|------|----|-------|--------|
| 50 | .... | 50 | 100   | 4      |

### OBJECTIVE:

- To be able to understand hospital departments and hospital systems individually with the latest concepts and their incorporation through innovation in Medical architecture.

### METHODOLOGY:

- This is a research exercise where students will choose a hospital department and will study its various aspects as per the scope of the research.
- Discussions with the supervisor and site visits as required.

### CONTENT:

#### Hospital Departments

- Hospital front-of-the-house and back-of-the-house departments
- Hospital clinical and Non Clinical departments
- Hospital ancillary services departments
- Hospital Auxiliary services
- Hospital support services departments
- Healthcare indicators.
- Indian healthcare facilities versus world healthcare facilities.
- Health problems of developing Nations.

#### Hospital Systems

- Hospital Signage systems
- Hospital Traffic flow systems
- Hospital Equipment
- Hospital Landscape
- Hospital infections
- Hospital waste management

### OUTPUT:

- The Dissertation report is to be submitted at the end of the semester and should be communicated in any peer-reviewed journal/refereed journal.

## MHA-301: HEALTHCARE FINANCE

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 0    | 2     |

### EXAMINATION MARKS

| IA | WR | VV  | TOTAL | CREDIT |
|----|----|-----|-------|--------|
| 25 | 25 | ... | 50    | 2      |

### OBJECTIVE:

- To make a base of sound understanding of the financial aspect of healthcare institutions.

### METHODOLOGY:

- Lectures and presentations based on field observations, surveys, web searches and library studies.

### CONTENTS:

- National Budget on healthcare and its comparisons with global trend
- Role of Financial management in healthcare structures.
- Financial feasibility report of healthcare structures / DPR.
- Types of Budgets in Healthcare Institutions.
- Cost of healthcare structures: Consultancy, construction, commissioning, liasoning, running cost, maintenance budget, Expansion.
- Role of Architecture in the cost of a healthcare project.
- Hospital budgeting: Equipment, furniture, human resources, safety and security, Accreditation.
- Economics: Economics in health care system.
- Capital/ Financial planning process: models of finance in healthcare as Bismarck model

### OUTPUT:

- The output should be presented at the end of the semester in the form of a financial statement with all revenue and expenditure heads of a running/new hospital proposed hospital.

## **MHA-302: HEALTHCARE SERVICES: GLOBAL OPPORTUNITIES AND STRATEGY**

### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 0    | 2     |

### **EXAMINATION MARKS**

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 25 | 25 |    | 50    | 2      |

### **OBJECTIVE:**

- To identify global healthcare services and their potential and opportunities with respect to the Indian scenario.
- To analyse mechanisms to connect healthcare facilities with the global market

### **METHODOLOGY:**

- Lectures and presentations based on field studies and secondary sources.

### **CONTENTS:**

- Application of Principles of Hospital Accreditation to Hospital and Healthcare Buildings. It should include a review of National and selected International Codes as applicable to Hospital and Healthcare Buildings.
- Design Parameters for Building Engineering Services in Healthcare & Hospital Facilities.
- New medical practices and their facilities around the world.
- Dynamics of Global Healthcare Services
- Traditional medicine systems of the world with a specific focus on Indian traditional systems
- Patients behaviour and trends towards regional medicine systems
- Famous Destinations around the globe which are famous for meditations and their importance.
- National and International Business Modules of healthcare delivery.
- Medical tourism and emerging medical techniques e.g Botox and hair transplant etc

### **MHA-303: HEALTHCARE PLANNING-III**

#### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

#### **EXAMINATION MARKS**

| IA | WR | VV  | TOTAL | CREDIT |
|----|----|-----|-------|--------|
| 50 | 50 | ... | 100   | 4      |

#### **OBJECTIVE:**

- To equip students with complexities in the design of health care.
- To understand the need for the creation of a healthy built environment.
- To equip students with modernization and expansion in hospitals.

#### **METHODOLOGY:**

- Lectures & tutorial exercises.

#### **CONTENTS**

- Art in health, Healing environment:
- Health care planning: preparation of Vision, Mission & Services
- System adaptability: Moving from old systems to contemporary systems,
- Adaptive reuse, regeneration, Flexibility, adaptability & Expansion in hospitals.
- Planning, design, contract documents, construction & operation of healthcare facilities.
- Norms & policies: Health policies & Allied norms
- Concepts in health infrastructure. Social and physical infrastructure
- Qualitative and quantitative techniques of assessing requirements, planning amenities and institutions.
- Public and private sector role in resource mobilization. Instruments of resource mobilization.
- Quality control mechanisms, institutions.
- Concepts of decentralization of development and management.
- Concept and scope of outsourcing in healthcare.
- Programming of Engineering Services for Hospital Building as electrical, ETP, STP, HVAC etc
- Programming and Designing Centralized Services for Hospital buildings such as Medical records, Parking, Laundry, catering etc.

## MHA-304: HOSPITAL INTERIOR DESIGN

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | -  | 50 | 100   | 4      |

### OBJECTIVE:

- The objective shall be to comprehend, document, analyze, and critique the complexities of hospital interiors and their sensitivity and departmental uniqueness. And develop the design abilities of students to cater to contemporary interior design challenges.

### METHODOLOGY:

- Studio Exercise.
- Documentation & presentation of interior design of Existing healthcare facilities.
- Conceptual design scheme

### CONTENTS

- Healing environments and interior design of hospital
- Basic elements of interior design
- Basics of Furniture Design
- Digital technology integration.
- Intelligent and smart façade of the hospital
- Interior automation
- Basics of Interior Services
- Evaluation of Mini Project
- Lighting and colour psychology in healthcare settings.
- Acoustics in Interiors
- Advanced Interior Services
- Hospital signage
- Materials selection and Finishes.
- Renovation and Alteration.

### OUTPUT:

- The output will be an interior portfolio which includes detailing of an area from the studio exercise, incorporating all the interior design details.

### **MHA-305: HOSPITAL SERVICES - III**

#### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

#### **EXAMINATION MARKS**

| IA | WR | VV  | TOTAL | CREDIT |
|----|----|-----|-------|--------|
| 50 | 50 | ... | 100   | 4      |

#### **OBJECTIVE:**

- To develop a basic understanding of Nursing services in healthcare facilities and incorporation of spaces in design

#### **METHODOLOGY:**

- Lectures introducing various concepts of Nursing in healthcare facilities.

#### **CONTENTS**

##### **Planning and designing of Nursing Services**

- General Nursing Unit
- Obstetrical Nursing Unit
- Isolation Rooms
- Newborn Nurseries
- Cardiac Catheterization Therapy
- Transfusion Chambers
- Dialysis Unit
- Pediatrics Nursing unit
- Psychiatric Nursing unit
- Intensive Care Unit (ICUs)
- Pulmonary medicine
- Chemotherapy Wards- Daycare
- High Dependency Units

##### **Planning and designing of Public Areas & Staff Facilities**

- Entrance and lobby area
- Main Waiting Area
- Staff Facilities
- Meditation Room
- Coffee shop/ Gift shop etc.

##### **Programming and Designing of Maintenance Services for Hospital Building**

- Landscaping Maintenance Services
- Waste Management Services
- Housekeeping Services
- Building Maintenance Services and Hospital Design

### **MHA-306: STUDIO- III**

#### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 6    | 8     |

#### **EXAMINATION MARKS**

| IA  | WR  | VV  | TOTAL | CREDIT |
|-----|-----|-----|-------|--------|
| 100 | ... | 100 | 200   | 8      |

#### **OBJECTIVE:**

- Exploring and designing large-scale and complex healthcare facilities.

#### **METHODOLOGY:**

- Studio Exercise.
- Case studies are to be clubbed with library research & live surveys.
- Detailed design scheme

#### **CONTENTS**

The studio exercise should focus on the designing of specialized and complex health-care facilities of large scale. The scale may vary from 1000-2500 beds. These may include medcity, medical colleges, dental colleges, nursing colleges, large general hospitals, covid centres of large capacities, and specialized hospitals such as cardiac hospitals, Oncology, paediatrics, maternity hospitals, Liver and Biliary sciences, Renal, Trauma centres, Neurology, Nephrology, Gastroenterology, ENT, etc.

#### **OUTPUT:**

- The output should be a well-designed 1000-2500 bed general hospital or specialised hospital with a complete set of drawings and Models.

## **MHA-307: ELECTIVE-II**

### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### **EXAMINATION MARKS**

| IA | WR  | VV | TOTAL | CREDIT |
|----|-----|----|-------|--------|
| 50 | ... | 50 | 100   | 4      |

### **OBJECTIVE:**

To work on any specialized services in a hospital

### **METHODOLOGY:**

The methodology of imparting information should be lectures and presentations citing examples and case studies.

### **CONTENTS:**

#### **Building services**

1. Electrical services
2. Fire services
3. Lighting services
4. Architectural Building Acoustics
5. Intelligent Building Services
6. Piped Medical Gas services
7. HVAC

### **OUTPUT:**

- The Elective report is to be submitted at the end of the semester and should be communicated in any peer-reviewed journal/refereed journal.

## MHA-401: PROJECT MANAGEMENT

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 2    | 4     |

### EXAMINATION MARKS

| IA | WR | VV | TOTAL | CREDIT |
|----|----|----|-------|--------|
| 50 | 50 | -  | 100   | 4      |

### OBJECTIVE:

- To study the management aspects related to the Thesis topic and formulate a management framework or proposals.

### METHODOLOGY:

- Lectures and Presentations.
- Case Studies (primary & secondary)

### CONTENTS:

- Hospital Project life cycle - processes from inception to post-construction.
- Hospital CPM & PERT analysis
- Applications of cost-benefit analysis, Feasibility Report, value engineering etc.
- Hospital Project Planning and Project Monitoring and Control
- Application of project management processes (i.e., communication and integration, scope, time, cost,
- Health, safety and environment, risk management, human resource management
- DPR preparation
- Project Procurement and Management
- Study of procurement guidelines of international institutions such as FIDIC, WORLD BANK, ADB etc.
- Commissioning of the hospital, Shakedown period
- Project Management - Organisation, Roles and Responsibility

## MHA-402: THESIS

### TEACHING HOURS

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 14   | 16    |

### EXAMINATION MARKS

| IA  | WR  | VV  | TOTAL | CREDIT |
|-----|-----|-----|-------|--------|
| 200 | ... | 200 | 400   | 16     |

### OBJECTIVE:

- Thesis projects must reflect the culmination of the development of the student's architectural design skills. The project must be chosen out of 500 bedded/specialised hospitals to address, through design, covering all aspects of the design process.

### METHODOLOGY:

- The student must submit to the department the synopsis of at least two design/research projects for approval, out of which one would be selected depending upon its merit for the scope of design intervention and its scale.
- A guide to supervise will be appointed by the head of each student. Regular progress will be monitored in stages.

### CONTENTS

The Medical architecture thesis is the culmination of four semesters of theory and design inputs course.

The thesis opted for by students will be categorized under two typologies.

1. Research-based thesis.
2. Design based thesis

The product must consist of well well-formatted professionally produced report in the case of a research thesis, and a set of drawings, models etc. to demonstrate the issue-based design thesis. A report would be necessary in this case as well.

The thesis is more than a terminal project and must have a point to prove. It must make an original contribution through generic principles, replicable in other health facility design situations. A thesis must address contemporary issues/challenges/systems of healthcare facilities with the latest concepts and their incorporation through innovation in the Medical architecture.

## **MHA-403: INNOVATIONS & RESEARCH IN HEALTHCARE ARCHITECTURE**

### **TEACHING HOURS**

| L | T/ST | TOTAL |
|---|------|-------|
| 2 | 6    | 8     |

### **EXAMINATION MARKS**

| IA  | WR  | VV  | TOTAL | CREDIT |
|-----|-----|-----|-------|--------|
| 100 | ... | 100 | 200   | 8      |

### **OBJECTIVE:**

- To be able to understand the latest innovation concepts and their incorporation through innovation in the Medical architecture.

### **METHODOLOGY:**

- This is to foster innovation through exercises where student will choose a topic and will study its various aspects as per the scope of the research.
- The innovation exercise may be clubbed with the thesis.

### **CONTENTS**

The topics may include

- Models of innovations
- Design innovations
- Role of Artificial Intelligence
- Robotics in Hospital
- Covid -19 design strategies
- Building Innovations
- Material innovations
- Medical science innovations
- Case study of the latest innovation in healthcare Architecture.

### **OUTPUT:**

- The report to be submitted at the end of the semester comprising the Study and conclusions/proposals/guidelines based on the reconnaissance and application of the Thesis project.