MASTERS IN ARCHITECTURE-
SCHEME OF EXAMINATION,
TEACHING SCHEDULE & SYLLABUS (1st Semester) – 2013

Punjab Technical University Kapurthala

PREAMBLE

Twenty first century has rightly been called century of urbanization with globalization and liberalization of economy leveraging enormous growth and development of human settlements. This growth and development of human settlements is distinctly marked by large construction of built environment, not only in volumetric terms but also in size and shape, which are fast emerging on the urban canvas. Considering the role and importance of Architecture as definer of the built environment, it becomes critical that appropriate level of skills and competencies are generated in the region to design not only state of art and cost-effective, but also energy efficient and sustainable buildings and cities to provide assured quality of life to its residents. This becomes all the more important when buildings and cities have been rated to be largest consumers of energy, natural resources and generators of waste but also major contributors to the economy, employment and services/ amenities.

In the given context and considering the future requirement of higher order of professional manpower and skills, both for the academics and the architectural practice, Punjab Technical University has taken the initiative to permit full time courses in Architecture leading to the award of Masters in Architecture. The course will provide opportunities to large number of under-graduates passing from various Architecture institutions in the state of Punjab to achieve higher order of skill, proficiency and competency in the profession of Architecture besides improving options for better employment. Availability of manpower educated, will also help in meeting the shortage of qualified faculty in Architectural Institutions besides improving the standards of Architectural education.

Considering the fact that Architecture is the product of planning , designing and construction of buildings besides being art and science of designing of buildings / structures, the course has been designed in such a way that it addresses and focuses on all the issues and areas which require indepth study and detailed analysis to evolve design solutions for buildings which are not only environment friendly in terms of production of materials but also have minimum adverse impact on environment, and consume minimum resources and energy for heating, cooling etc to make buildings comfortable and users friendly.

The Master's course shall be a full time course of two years duration, divided into four distinct Semesters of 18 weeks duration each . Each semester will have allocation of 600 marks and the student would be required to secure minimum of 40% marks individually in each subject and 50% in the aggregate to be eligible for the award of Master's degree in Architecture. After completion of course of study and subject to fulfilment of other conditions of eligibility, as may be specified by the University from time to time, the student shall be eligible for the award of Masters in Architecture (M. Arch).

The eligibility for the course shall be B.Arch awarded by any University or equivalent, duly listed in the Schedule of the Indian Architects Act, 1972 making the person eligible for the registration as Architect under the Act ,with minimum of 50% marks at the graduate level.

Considering the requirements of higher level of education in Architecture, the course curricula has been structured/ designed in such a manner that it achieves the objectives of Architecture involving Durability, Utility, Sustainability, Cost-effectiveness,Energy efficiency and Beauty. Accordingly first three semesters have been designed to have distinct focus on Urban Design, Housing and Advance Building Systems/Technologies respectively with Dissertation as the focus in the fourth semester.

Design Studio in each semester has been dedicated to main theme of semester to carry out studies of the existing problems on the ground with live projects, in order to expose students to the ground realities and make them evolve best options. Class room teaching is proposed to be supplemented with the Architectural practice in order to get the two for promoting better quality of education.

In addition, elective subjects, which would make value addition to the course, have been made integral part of the course structure. Such subjects include learning in making buildings safe against disaster and energy efficient. The course also include study of Tall buildings, in terms of their planning, designing and construction, which are fast emerging as the future options of designing buildings/ cities providing image- ability besides promoting optimum utilisation of scarce and valuable resource-land. With these innovations, the course structure and scheme of Examination for the Master's Course besides the course contents and syllabus for the first semester has been prepared and is detailed below:

PUNJAB TECHNICAL UNIVERSITY

Code No.	Subject	Credit	Lecture	Seminar/ Tutorial	Studio /Workshop/ Field work	Total	MAX. MARKS		Total	Duration (Hrs) Univ. Exam Viva-Voce/ Practical
							INT. MKS	EXT. MKS		
SEMESTER 1										
MACH 101	**DESIGN STUDIO – 1 (URBAN DESIGN)**	6	2	-	8	10	100	100	200	External Viva-voce
MACH 102	**THEORY OF URBAN DESIGN**	3	2	2	-	4	50	50	100	03
MACH 103	**CONTEMPORARY ARCHITECTURE**	3	2	2	-	4	50	50	100	03
MACH 104	**LANDSCAPE ARCHITECTURE**	3	2	2	-	4	50	50	100	03
MACH 105	**RESEARCH METHODOLOGIES**	3	2	2	-	4	50	50	100	03
	TOTAL	**18**	**10**	**8**	**8**	**26**	**300**	**300**	**600**	
SEMESTER 2										
MACH 201	**DESIGN STUDIO – 2 (HOUSING)**	6	2	-	8	10	100	100	200	External Viva-voce
MACH 202	**HOUSING (SOCIO-ECONOMIC & CULTURAL ASPECTS)**	3	2	2	-	4	50	50	100	03
MACH 203	**HOUSING POLICIES & PROGRAMS**	3	2	2	-	4	50	50	100	03
MACH 204	**SUSTAINABLE ARCHITECTURE**	3	2	2	-	4	50	50	100	03
MACH*	**ELECTIVE-I**	3	2	2	-	4	50	50	100	03
	TOTAL	**18**	**10**	**8**	**8**	**26**	**300**	**300**	**600**	

MASTERS IN ARCHITECTURE- SCHEME OF EXAMINATION-2013

ELECTIVE- I

- MACH 205 **VERNACULAR ARCHITECTURE**
- MACH 206 **TRAFFIC & TRANSPORTION**
- MACH 207 **ADVANCE COMPUTER APPLICATIONS IN ARCHITECTURE**

Code No.	Subject	Credit	Lecture	Seminar/ Tutorial	Studio/ Workshop/Field work	Total	MAX. MARKS		Total	Duration (Hrs) Univ. Exam Viva-Voce/ Practical
							INT. MKS	EXT. MKS		
SEMESTER 3										
MACH 301	**DESIGN STUDIO – 3 (SYSTEMS & TECHNOLOGIES)**	6	2	-	8	10	100	100	200	External Viva-voce
MACH 302	**ADVANCE BUILDING SYSTEMS & TECHNOLOGIES**	3	2	2	-	4	50	50	100	03
MACH 303	**PROJECT MANAGEMENT**	3	2	2	-	4	50	50	100	03
MACH 304	**DISSERTATION-I**	3	2	-	2	4	50	50	100	External Viva-voce
MACH 305	**ELECTIVE-II**	3	2	2	-	4	50	50	100	03
	TOTAL	**18**	**10**	**6**	**10**	**26**	**300**	**300**	**600**	
SEMESTER 4										
MACH 401	**DISSERTATION-2**	15	6	-	18	22	200	300	500	External Viva-voce
MACH 402	**ARCHITECTURAL CONSERVATION**	3	2	2	-	4	50	50	100	03
	TOTAL	**18**	**8**	**2**	**18**	**26**	**250**	**350**	**600**	

ELECTIVE- II

- **FUTURISTIC ARCHITECTURE**
- **TALL BUILDINGS**
- **DISASTER MANAGEMENT**

COURSE CONTENTS
MASTERS IN ARCHITECTURE-1ST SEMESTER - 2013
DESIGN STUDIO – 1
MACH 101

University Exam Marks	-	100
Sessional Marks	-	100
Duration of Exam	-	Viva-Voce
No. of contact hrs.	-	10 per week

INTENT

To make students understand the genesis of morphology and problems of existing towns and cities in spatial settings and to evolve solutions for rationalising their growth and development.

CONTENTS

1. **Study** of an existing town or parts of the town .
2. **Documentation and Analysis** of Urban Morphology, Transportation , Physical, Social , Cultural Aspects etc
3. **Identification** of existing Problems and Emerging Issues.
4 **Evolving Design Solutions** for the Study Area/Settlement.

. **References Books:**

1 **Design of cities**- **Edmund. N**
2 **Emerging Concepts in Urban Space design** -- **Broadbent. G**.
3 **Concept of urban design** - **Gosling D & Mattes.**
4 **Image of the City**-- **Kelvin Lynch** .
5 **The Architecture of towns and cities**-- **Spreiregen Paul D**

Teaching Methodology:

The focus of the design studio will be to carry out detailed documentation / study, undertake in-depth analysis of any selected settlement or parts thereof of the region to make students understand and appreciate the genesis and factors which led to the evolution , growth and development of the form, structure, public spaces and built form of the settlement and the emerging problems and possible solutions to create appropriate image and quality of life besides promoting orderly future growth and development of the town. In this process students would be required to carry out detailed visual and physical surveys and hold public interaction to understand problems and issues. The study will be substantiated with the secondary data available in the form of reports and studies/surveys already prepared/carried out.

Guidelines for the examiner

External Examiner will focus on examining and evaluating the student's understanding of the underlying forces which guide and shape the cities/parts , its form, structure and operation of the city besides quality of documentation, study, analysis etc and the quality of solutions offered in the context of urban design,

MASTERS IN ARCHITECTURE-1ST SEMESTER - 2013

THEORY OF URBAN DESIGN

MACH 102

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs.
No. of contact hrs. - 4 per week

INTENT

To familiarize students with historical perspective, theoretical framework including different theories and policies which guided the urban design of cities & towns.

CONTENTS:

Unit-1

1. **Introduction to Urban Design- Objectives and Scope**

- Introduction , Origin, Evolution, Growth and Development of Urban Design
- Relationship between Urban Design , Architecture and Town Planning.
- Objectives, Scope, Role, Importance, Relevance and Limitations of Urban Design
- Concept, Relevance, Scope and Importance of Imagability of a Town.

2. **Historical background**

- Review of Urban forms, Patterns and Spaces in different periods of history :
  - Ancient River Valley Civilisations
  - Roman Cities/Towns
  - Medieval Greek Cities/Towns
  - Cities/Towns
  - Renaissance Cities/Towns
  - Baroque Cities/Towns
  - Post Industrial Cities/Towns
  - Modern Period

3 **Elements of Urban Design and Basic Design**

- Elements of Urban Design
- Urban Morphology
- Urban Form
- Urban Mass
- Urban/Public Spaces
- Townscape
- Public Art
- Some Basic Urban Design Principles and Techniques.

Unit-2

4. **Study of Emerging Concepts in Urban Design** with examples in India and other countries for:

- Urban settlements
- Town centres
- Urban spaces.

5. **Urban Design Principles**, **Tools and Techniques**- Role and Typologies
6. **Brief Overview of Urban Legislation** in relation to Urban Design with respect to
    - Regional Plan
    - Development /Master Plans
    - Development Controls
    - Zoning
    - Environmental impact assessment

Reference Books:

1. **Design of Cities**- **Bacon, Edmund. N** .
2. **Emerging Concepts in Urban Space design** - **Broadbent. G** .
3. **Concept of urban design** - **Gosling D & Mattes**.
4. **Image of the City**- **Kelvin Lynch** .
5. **The Architecture of towns and cities** - **Spreiregen Paul D.**

Teaching Methodology:

- Emphasis shall be laid on understanding of evolution of Cities and Buildings . Continuous evaluation shall be made of students work based on various assignments
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits to historical and contemporary cities.

Guidelines For Paper Setter

- One compulsory question covering the course contents of both Units
- In addition, Four questions are to be set from each Units.
- Students are required to attempt five questions including compulsory question with two questions from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

MASTERS IN ARCHITECTURE-1ST SEMESTER - 2013
CONTEMPORARY ARCHITECTURE
MACH 103

University Exam Marks	-	50
Sessional Marks	-	50
Duration of Exam	-	03 hrs.
No. of contact hrs.	-	4 per week

INTENT:
To make students understand , appreciate and familiar with the recent Architectural Movements of importance and their impact on built environment.

CONTENTS:

Unit-1

1. **Overview of World Architecture since 1950 in relation to**:
   - Late Modernism
   - Post Modernism
   - De-constructivism
2. **Study of Various Theories governing Contemporary Architecture through :**
   - Case Studies
   - Architectural Trends
   - Impact on Urban Built Environment
3. **Emerging Building Typologies with Focus on:**
   - Residential Development
   - Offices & Commercial Development
   - Skyscrapers
   - Institutional Development
   - Public Development
   - Industrial Development

Unit-2

4. **Emerging Building Materials and Building Technologies**
5. **Disaster Management of Built Environment.**
6. **Advance Softwares in Architecture-Study and Applicability in Contemporary Architecture related but not limited to :**
   - Virtual Reality
   - Parametric Design
   - Programme Generated Architecture
   - Building Information Modeling (BIM).

Reference books:

1. **The Language of Post Modern Architecture by Charles Jencks**
2. **Modern Architecture since 1900 by William j. Curtis**.
3. **Intentions in Architecture by Nordberg Sclulzc**
4. **Contemporary Indian Architecture after the Masters by Bhatt V and Scriver P**
5. **"Architecture in the 20th Century", Vol. 1-2, Taschen, by Gossel, P. and Leuthauser, G.**

Teaching Methodology

- Emphasis shall be laid on understanding of journey of Architecture and trends guiding the profession in post- fifties and its impact on changing the typologies of various buildings including materials and technologies used . Continuous evaluation shall be made of students work based on various assignments
- Teaching in the subject will be a combination of Expert lectures, specific case studies and field visits.

Guidelines For Paper Setter

- One compulsory question covering the course contents of both Units.
- In addition, Four questions are to be set from each Units.
- Students are required to attempt five questions including compulsory question with two questions from each Units.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

MASTERS IN ARCHITECTURE-1ST SEMESTER - 2013

LANDSCAPE ARCHITECTURE

MACH 104

University Exam Marks 50
Sessional Marks - 50
Duration of Exam - 03 hrs.
No. of contact hrs. - 4 per week

INTENT

To familiarize and impart students with the advance knowledge of Landscape as a Specialized Subject considering Environmental and Architectural Implications.

CONTENTS

UNIT 1

1. **Introduction to Landscape Design involving:**
   - Landscape Typologies and their Characteristics
   - Linkages with Nature and Built Environment
2. **Elements and Materials of Landscape Design involving:**
   - Plants-Characteristics and Usability of various types of Plants
   - Topography- Characteristics and Relevance in Landscaping.
3. **Landscape Conservation**:
   - Purpose, Role and Importance
   - Preparatory Procedure,
   - Maintenance of Existing Landscape.

UNIT 2

4. **Urban and Regional Landscape Design**:
   - Nature and Contents
   - Ecological and Environmental aspects.
5. **Landscape Profession and Practice in relation to** :
   - Architecture,
   - Built Environment.
6. **Landscape Design Schemes for various Buildings including but not limited to**:
   - . Residential
   - Commercial
   - Institutional
   - Public
   - Industrial

Reference books:

1. **Barlow, R.E., " Landscape Design: A Cultural and Architectural History", Harry N. Abrams.**
2. **Hunt, J.D., "Greater Perfections: The Practice of Garden Theory", Thames & Hudson**

3. **Kaplan, R., Kaplan, S. and Ryan, R., "With People in Mind: Design and Management of Everyday Nature*", Island Press.***
4. **Reid, G.W., "Landscape Graphics", Watson-Guptil**
5. **Ruggles, D.F, " Islamic Gardens and Landscapes", Univ. of Pennsylvania Press**
6. **Laurie, Michael, "Introduction to Landscape Architecture"**

Teaching Methodology

- Emphasis shall be laid on understanding the use of landscape as an integral part of built environment and various elements and patterns used in the Landscape design of various buildings ,cities and regions. Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the gardens developed over the period, landscape projects of repute, study of native and other trees etc

. Guidelines For Paper Setter

- One compulsory question covering the course contents of both Units.
- In addition, Four questions are to be set from each Units.
- Students are required to attempt five questions including compulsory question with two questions from each Units.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

MASTERS IN ARCHITECTURE-1ST SEMESTER - 2013

RESEARCH METHODOLOGY

MACH 105

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs.
No. of contact hrs. - 4 per week

INTENT:

To Promote Research in Architecture by making students aware and familiarize with various Methods of Research and Analysis .

CONTENTS:

UNIT 1

1. "Research" and its Significance in Architecture involving:

- Meaning of Research**.**
- Relationship between Design and Research.
- Types of Research, Areas of Research ,
- Qualitative and Quantitative Paradigms.

2. Methods of Research in Architecture including:

- Interview
- Questionnaire including Designing Questionnaire
- Surveys- Pre & Post Occupancy Survey
- Observation
- Mapping

3. Research Design:

- Components of Research,
- Literature Study and Research- formulating Questions, Hypothesis, Closing the Samples,
- Methods of Data Collection, Analysis and drawing Inferences
- Concepts of Dependent,
- Significance of the Research Outcome.
- Preparing Time Schedule & Budget for a Research Plan.

UNIT 2

4. Research Analysis: Content Analysis, Data Documentation and Analysis:

- Analysis- Content Analysis, secondary data analysis, relative advantages/ disadvantages and making choice of most appropriate method
- Data Documentation and Analysis- Understanding the nature of data collected/ making choice of most appropriate method
- Converting data into Numerical form for data analysis.

5 Introduction to the Statistics involving:

- Simple Statistical Methods of Analysing and Interpreting Data.

- Softwares for Statistical Data Analysis - Reporting and Presentation of the Data:
- Techniques of Data Presentation – Graphic , Drawings / Maps etc
- Reporting Research-Technical Writing / Language including Formatting

Reference-Book

1. **Research Design: Qualitative & Quantitative Approaches -- Creswell, J.W.**
2. **Surveys in Social Research, Jaipur -- De Vaus, D.A**
3. **Qualitative Data Analysis: A User Friendly Guide for Social Scientists -- Dey,**
4. **Architectural Research Methods -- Groat, L. &Wang D.**
5. **Handbook of Qualitative Research -- Norman K Denzin and Yvonna S Lincoln (Eds.)**

Teaching Methodology

- Emphasis shall be laid on understanding the role of research in Architecture. Students will be asked to carry out detailed survey of any residential/ commercial/ slum etc through different methods defined in the contents and prepare a research report based on the data collected, analysis made based on various statistical tools and conclusions drawn. Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, case studies and making reference to already prepared research reports.

. **Guidelines For Paper Setter**

- One compulsory question covering the course contents of both Units .
- In addition, Four questions are to be set from each PART.Students are required to attempt five questions including compulsory question with two questions from each Units.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
DESIGN STUDIO – 2 (Housing)
MACH - 201

University Exam Marks - 100 (No exam. Only viva-voce by external jury)
Sessional Marks - 100
No. of contact hrs. - 10 per week

INTENT

To make students understand and appreciate the impact of socio-economic, cultural, environmental and technological factors on the design solutions for Housing of different groups.

CONTENT

Two Housing Projects during the semester with one from each unit:

Unit-1

- Mixed Housing for different income groups in urban areas.
- Slum Rehabilitation schemes

Unit-2

- Special category housing
- Transit housing for people affected by natural and man-made disasters.

Teaching Methodology

The focus of teaching shall be research, in-depth study and analysis of activities related to:

Need and feasibility of the project considering socio-economic, geographical, local and climatic conditions; special design considerations for the users; Development control legislations; Amenities for the residential development; Case studies to substantiate the design philosophy; Impact of the development on adjacent neighbourhood; Evolving design brief for the Project; Designing typical modules for various dwellings.

The final project work will include Architectural drawings & relevant details, case studies and analysis

Guidelines to the examiner

External marks shall be awarded through viva-voce conducted by two external examiners appointed by the university. The basis of evaluation shall be quality of research carried out and design solutions evolved by the students.

Reference Books:

1. Planning and Architecture Edited by Dennis Sharp Editor
2. Planning feasible learning places By Leggett S Bru Baker C. W. & Cohodes A.
3. Methods in Architecture By. Town Health

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
HOUSING (Socio-Economic and Cultural Aspects)
MACH - 202

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To promote understanding of housing in the context of social, economic, cultural and environmental aspects.

CONTENT

Unit-1

- Introduction to housing,
- Study of Socio-economic and environmental aspects
- Housing infrastructure- physical and social
- Housing shortage- reasons and remedies.

Unit-2

- Rural and EWS Housing schemes
- Affordable housing
- Cost effective housing
- Sustainable Housing

Unit-3

- Selected Case studies of state of art housing schemes in India and developing countries with reference to design criteria, services, amenities, socio-economic, cultural and environmental aspects.

Teaching Methodology

- Emphasis shall be laid on making students understanding the issues related to design, services and amenities, social, economic, cultural and environmental aspects of various types of housings.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the various housing schemes etc.

Guidelines to the Paper Setter

- **One compulsory question** is to be set covering the entire syllabus in the shape of short answers.
- In addition, **three questions are to be set from unit 1 & 2 and two questions from unit 3**.
- Students are required to attempt **five questions** including compulsory question with minimum one question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. National Building Code 2005
2. Housing by Macsai john.
3. Population and Housing problems in India by Maurya S.D.

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
HOUSING POLICIES AND PROGRAMS
MACH - 203

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No of contact hrs. - 04 per week

INTENT

To make students understand the contents, intent, role and importance of various policies and programs in addressing issues of shelter for various categories.

CONTENT

Unit-1

- Housing policies and programs- Urban and Rural
- Mass housing programs- Urban and rural
- Policies and programs related to Slums
- Urban Housing renewal schemes

Unit-2

- Housing Finance
- Housing Financing Institutions
- Housing agencies
- Cost-effective housing
- Affordable housing

Unit-3

- Selected Case studies of successful housing policies and programs in India , developing and developed countries

Teaching Methodology

- Emphasis shall be laid on understanding the issues related to housing schemes, programs and policies for various types of housing.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the various housing schemes etc.

Guidelines to the Paper Setter

- **One compulsory question** will be set covering the entire syllabus in the shape of short answers.
- In addition, **three questions are to be set from unit 1 & 2 and two questions from unit 3**.
- Students are required to attempt **five questions** including compulsory question with minimum one question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Reference Books:

1. Five Year Plans- Planning Commission of India, Govt. of India.
2. Housing Policies 1988, 1994, 1997, 2007- Govt. of India.
3. Housing programs in India- Govt of India.
4. JNNURM- Govt. of India.
5. Affordable Housing Policies by Govt. of India and Indian states.
6. Slum Free Cities- Govt. of India.
7. New Landscape by Charles Correa.
8. Reports of Govt. of India on Housing Shortage.

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
SUSTAINABLE ARCHITECTURE
MACH - 204

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT
To equip the students with the genesis and knowledge in the area of Sustainable Architecture.

CONTENT

Unit-1

- Scope, role and importance of Sustainability.
- Sustainability- Principles, Concepts and Resources.
- Sustainable building- Features and design principle.

Unit-2

- Sustainable building materials-components and manufacturing
- Climatic and sustainability – Climatic Zones, Characteristics and design implications.
- Role of built-form in promoting sustainability.

Unit-3

- Design Standards- Day lighting, ventilation, thermal comfort, Indoor environment etc.
- Sustainable building technologies.
- Sustainable architecture in the context of Vernacular and Traditional architecture
- Case studies of Sustainable architecture in India and abroad.

Teaching Methodology

- Emphasis shall be laid on understanding of issues related to sustainable architecture.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, specific case studies and field visits to sustainable buildings/complexes.

Guidelines to the Paper Setter

- **One compulsory question** covering the course contents of entire syllabus in the shape of short answers.
- In addition, **three questions are to be set from unit 1 & 2 and two questions from unit 3.**
- Students are required to attempt **five questions** including compulsory question with minimum one question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. Handbook of Energy Conscious Buildings by: J.K. Nayak & J.A. Prajapati.
2. Climate Responsive Architecture: A handbook for energy efficient buildings by Arvind Kishan, Nick Baker, Simos yannas, S.V. Szolklay, Isaac Meir, Yair Etzion.
3. Architecture and the environment (bioclimatic building design): by Jones, David Lloyd.
4. Climate responsive Design: A Study of Buildings in Moderate and Hot Humid Climates by Hyde, Richard.
5. Research notes on climate:- CBRI, Roorkee
6. Energy Efficient Buildings in India:- TERI

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
VERNACULAR ARCHITECTURE
MACH 205-E/L

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To understand the context and implications of region, climate and culture in Vernacular Architecture.

CONTENT

Unit-1

- Introduction to Vernacular architecture – geographical terms and climatic zones.
- Scope of Vernacular architecture in contemporary architecture-- comparative studies in form and function.

Unit-2

- Building materials and construction methodologies -in regional context in Indian subcontinent.
- Study of resources, services and management of the habitats in various regions

Unit-3

- Study of a cluster of existing habitation in rural or urban context highlighting vernacular characteristics.
- Study of Contemporary regionalism
- Study of selected state of art buildings incorporating vernacular architecture.

Teaching Methodology

- Emphasis shall be laid on understanding genesis and issues related to Vernacular Architecture.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, case studies/visits to the various historic/vernacular buildings.

Guidelines to the Paper Setter

- **One compulsory question** shall be set covering the course contents of entire syllabus in the shape of short answers.
- In addition, **three questions are to be set from unit 1 & 2 and two questions from unit 3.**
- Students are required to **attempt five questions** including compulsory question with one question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. Vernacular Architecture: An Illustrated Handbook By R.W. Brunskill
2. Architecture without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky.
3. Bhatia, Gautam- Laurie Baker, Life, Work, Writings, New Delhi, India.
4. “Encyclopedia of Vernacular Architecture of World” by Oliver Paul
5. Vernacular Architecture in Himachal Pradesh by Jay Thakkar

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
TRAFFIC AND TRANSPORTATION
MACH 206-E/L

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To make students understand the role and importance of traffic and transportation in shaping the urban form and promoting urban sustainability.

CONTENT

Unit-1 Urban Structure, Transportation Systems, Studies and Surveys

- Transport based urban forms – characteristics, comparative advantages and disadvantages
- Transportation systems – design/operating characteristics and comparative analysis
- Urban Road- hierarchy, characteristics , role , function and planning
- Transportation surveys and studies – analysis and interpretation
- Planning for road safety
- Transport corridor oriented development.

Unit-2 Transport Management and Environment

- Management of transportation system --Organizational and legal framework.
- Transportation and Environment- air and water pollution , mitigation techniques
- Highway landscaping- norms , standards , planning framework.
- Environment Impact Assessment (EIA) of transport projects.
- Energy and transportation- Sustainable Transportation.

Unit-3 Transportation Policies and Planning

- Critical Review of Transport Policies
- Pricing and funding of major transportation projects
- Mass transportation
- Planning for bicycles and pedestrians in the urban context.
- Study of best examples of metro and rapid bus system in India and abroad

Teaching Methodology

- Emphasis shall be laid on making students understand the role and importance of traffic and transportation in effective and efficient functioning of urban settlements.
- Continuous evaluation shall be made of student's work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the critical urban areas having traffic problems and visiting good examples in traffic planning,

Guidelines For Paper Setter

- **One compulsory question** shall be set covering the entire course in the shape of short answers.
- In addition, **three questions are to be set from unit 1 & 2 and two questions from unit 3**.
- Students are required to attempt five questions including compulsory question with one question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Reference Books:

1. Future Transport in Cities By Brian Richards
2. Traffic and Transport : Maxwell G. Lay
3. Transport Planning and Traffic Engineering: Coleman A. O'Flaherty
4. Transport Planning and Traffic Engineering by Butterworthy-Heinemann
5. National Urban Transport Policy

MASTERS OF ARCHITECTURE- 2ND SEMESTER - 2013
ADVANCED COMPUTER APPLICATION IN ARCHITECTURE
MACH 207-E/L

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To make students appreciate, understand and learn the advance application of computers in the art and science of architecture in the context of current needs of the profession.

CONTENT

Unit-1

- Context, scope and Application of software Revit Architecture Suite involving building information modelling (BIM) and 3D Max.
- Context, scope and Application of software-
  - Sketch-up
  - Podium and
  - E-view.

Unit- 2

- Context, scope and Application of software involving construction planning management--Catia and Primavera
- Context, scope and Application of software related to energy simulation modelling --Design Builders etc.
- Context, scope and Application of software including-
  - M.S. Pro
  - Power Sim
  - MATLAB
  - Arc GIS for planning

Teaching Methodology

- Emphasis shall be laid on making students understand the role and importance of Available software in evolving design solutions and day to day learning and practicing of the profession with practical orientation.
- Continuous evaluation shall be made of student's work based on various assignments.
- Teaching shall be imparted through a combination of class room teaching, lab work and lectures by subject experts
- Knowledge of the computer shall be made integral part of studio problems with emphasis on practical learning
- Listed Softwares shall be made available in the Computer lab to the students for effective teaching.

Guidelines to the Evaluationr

- Evaluation in the subject shall be made by External Examiner appointed by the University

- Evaluation shall be based on student's understanding of the subject and application of the softwares.
- The exam shall be conducted on the pattern of practical exam involving written part, application of the softwares for a given design and viva-voce

Reference Books:

1. Omura G., "Mastering Revit 2009", Sybex Publication.
2. Omura G., "Bible 3D. Max 2009", Sybex Publication.
3. Manuals of Sketchup, Podium, E-view, Catia and Primavera.
4. Manuals of Design Builders and Energy Simulation Modeling.
5. Manuals of M.S. Pro and Power Sim.
6. Manuals of MATLAB and Arc GIS.

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
DESIGN STUDIO – 3 (Systems & Technologies)
MACH - 301

University Exam Marks - 100 (No university exam. Only viva-voce by external jury)
Sessional Marks - 100
No. of contact hrs. - 10 per week

INTENT

To promote understanding of built environment in terms of various built systems and technologies involved in designing, construction, material and safety of buildings having large footprints.

CONTENT

Two Projects involving large footprints during the semester with one from each unit:

Unit-1

- High Rise Buildings (Buildings using Pre-fabrication and Modular co-ordination)

Unit-2

- Horizontally spread- Airports, Stadia, Industrial buildings

Teaching Methodology

The focus of teaching shall be promoting research, in-depth study and carryout in depth analysis of activities related to:

Need and feasibility of the project considering latest construction technologies using prefabrication and modular coordination; technical requirements of using such methods and techniques Case studies on Impact of the such developments; Preparing design brief for the Project; Designing typical modules for various buildings

The final project work will include Architectural drawings & relevant details including case studies and analysis

Guidelines to the examiner

External marks shall be awarded through viva-voce conducted by two external examiners appointed by the university. The basis of evaluation shall be quality of research carried out and design solutions evolved by the students.

Reference Books:

1. Prefab Architecture: A Guide to Modular Design and Construction by Ryan E. Smith, John Wiley & sons.
2. Prefab Green by Michelle Kaufmann, Cathy Remick, Gibbs Smith Publishers, 2009.
3. Publications/Notes by CSIR-CBRI, Roorkee.

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
ADVANCE BUILDING SYSTEMS & TECHNOLOGIES
MACH - 302

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT
To promote understanding of high rise and large span structures, advanced building materials, building technologies including prefabrication and Modular co-ordination.

CONTENT
Unit-1

- Modular co-ordination- Concept, Scope, Applicability
- Prefabrication – principles, applicability, Advantages and Dis-advantages
- Study of Advance Building Materials and Nano Technologies

Unit-2

- Service and systems- Typologies, Principles and applicability
- Structure Systems- Sub-structures, Super Structure Typologies, Principles and applicability
- Building Maintenance – Systems, Principles, Procedures, Manuals

Unit-3

- Selected Case studies of latest projects in India/Foreign countries involving study of systems and technologies.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues related to high rise and large span structures, advance building materials, technologies including prefabrication and Modular co-ordination.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the various projects etc.

Guidelines to the Paper Setter

- **Three questions each are to be set from unit 1 & 2.**
- Students are required to attempt **four questions** with two question from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. National Building Code 2005
2. Structure in Architecture by Salvadori and Heller
3. Industrialized and Automated Building Systems: A Managerial Approach By Abraham Warszawski

4. Publications/Notes by CSIR-CBRI, Roorkee.
5. Prefab Architecture: A Guide to Modular Design and Construction by Ryan E. Smith
6. CBRI, Roorkee Advances in building Materials Construction
7. Integrated Building Systems- by Covll

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
PROJECT MANAGEMENT
MACH - 303

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT
To promote understanding of project management of large scale construction projects.

CONTENT

Unit-1

- Project Management- Definition, scope and applicability, role and importance
- Role of professionals in Project management, Quality and cost control
- PERT / CPM and Network Techniques/Time cost analysis and Value engineering
- Financial Management & accountability
- System for appraisal during construction.

Unit-2

- Management & Economics of Site and Equipment - Objective, scope principles, applications)
- Material management & Economics- procurement, inventory, cash flow.
- Human Resource Management & Economics- Requirements, Logistics & co-ordination of activities. System for Quality controls & check points

Unit-3

- Selected Case studies of projects of under construction with reference to project management.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues related to project management and techniques involved.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits to the various projects etc.

Guidelines to the Paper Setter

- **Three questions each are to be set from unit 1 & 2.**
- Students are required to attempt **four questions** with two questions from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics.

Reference Books:

1. Projects: Appraisal, Analysis, Financing, Implementation & Review; By Prasanna Chandra
2. Project Management By Kerzner H
3. Project Cost Control in construction; By Pilcher R
4. Chitkara, K.K. Construction Project Mangement, Tata-McGraw Hill.

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
DESSERTATION – 1
MACH - 304

University Exam Marks - 50 (No exam. Only viva-voce by external jury)
Sessional Marks - 50
No. of contact hrs. - 4 per week

INTENT

To promote the understanding and importance of research in architecture.

CONTENT

The students should be guided in their work by their selected / appointed guides throughout the semester to produce an illustrative, written dissertation. The dissertation calls for a substantial impetus on the quality and quantity of output, besides having a thrust on newer and more relevant areas of research / design and plan intervention / application of planning, design and analytical tools and techniques. The choice of subject, formulation of Design Programme, Site investigation and selection, and finally culmination in the design demonstration shall depend upon many factors such as student's personal interest, circumstances and abilities. A careful check shall be made to see that access is available to relevant buildings and to appropriate libraries, record offices, laboratories and other technical resources.

Students are expected to complete the project, with critical remarks and assessment from the guide. The output should be in the form of a illustrated report.

The student is free to choose any other Architectural topic of their interest and choice may not be limited to following reference list:

- Study may be based on with a focus on Innovative Theme, heritage, Restoration, Urban Design, Area, Building, Group of buildings, Campus etc.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues related to research and methodology.
- Continuous evaluation shall be made of students work based on assignments submitted periodically- problem identification, Literature review, Chapterizations, Pre-final, Final.
- Teaching shall be imparted through a combination of lectures by subject experts, site visits, literature study etc.

Guidelines to the examiner

External marks shall be awarded through viva-voce conducted by external examiner appointed by the university. The basis of evaluation shall be quality of research carried out and solutions proposed/evolved by the students

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
FUTURISTIC ARCHITECTURE
MACH – 305 (E/L)

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To identify major drivers (Ecology, Energy, Environment and Sustainability) of architecture in future involving technology, materials, space, land etc.

CONTENT

Unit-1

- Introduction to Futurology- meaning, scope, role and importance.
- Review of design philosophies of past and present
- Role of Ecology, Energy, Environment and Sustainability in defining architecture
- Future building forms/structural systems
- Futuristic building materials and construction technologies.
- Ecological Trends, Sustainability,

Unit-2

- Selected Case studies of emerging trends in architecture locally/globally.

Teaching Methodology

- Emphasis shall be laid on making students understanding the issues related to architecture for the future.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts etc.

Guidelines to the Paper Setter

- **Six questions are to be set from unit 1 .**
- Students are required to attempt **four questions**.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. Future Shock By Alvin Toffler
2. 2081: A Hopeful View of the Human Future Gerard K. O'Neill
3. A Short History of the Future By W. Warren Wagar

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
HIGH RISE BUILDINGS
MACH – 306 (E/L)

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT
To promote understanding of tall buildings, design principles, process, systems, services and components involved in tall building projects.

CONTENT
Unit-1

- Introduction to high rise buildings in urban environment, physical planning and design considerations
- EIA (Environment Impact Analysis) of high rise buildings
- Space planning and design standards, bye-laws and codes etc.
- High rise building and energy efficiency

Unit-2

- Study and analysis of various structural systems
- Building Services and amenities involving study of codal provisions.
- Construction and Materials involved
- Economics of High rise building
- Maintenance of High rise buildings

Unit-3

- Selected Case studies of sustainable and green high rise buildings including the concepts of Zero Energy Habitat.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues related to tall building design/structures/construction and services.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, site visits, case studies etc.

Guidelines to the Paper Setter

- **Three questions are to be set from both unit 1 & 2.**
- Students are required to attempt **four questions** with two questions from each Part.
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. Smith, B.S. and Coull, A., “Tall Building Structures- Analysis and Design” John Wiley & Son

2. Lin, C.F., “Construction Technology for Tall Buildings”, Singapore University Press.
3. Viswanath H.R., Tolloczko J.J.A. and Clarke J.N. , “Multi-purpose High Rise Towers and Tall Buildings”, Taylor & Francis
4. Environment and services –Peter Bucberry
5. The Tall building Refference book by-CTDHU
6. Skyscrapers: A History of the World's Most Extraordinary Buildings by Judith Dupre

MASTERS OF ARCHITECTURE- 3RD SEMESTER - 2013
DISASTER MANAGEMENT
MACH – 307 (E/L)

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT

To promote understanding of Disasters, disaster Management, relief operations and procedures etc.

CONTENT

Unit-1

- Disaster Management: Introduction, role and importance,
- Disaster- types, Causes and Issues
- Preparedness-Training, Response, Relief, Compensations and Financial aids
- Study of Legal provisions related to Acts and codes.
- Organisational structure at national/state/local levels
- Response and responsibilities, rescue, Recovery
- Emergency Management, Before and after disaster
- Damage Control- approaches, methods and technologies

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Unit-2

- Selected Case studies of disaster resistant structures and site visits, relief measures considered there in.

Teaching Methodology

- Emphasis shall be laid on making students understanding the issues related to Disaster Management.
- Continuous evaluation shall be made of students work based on various assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, visits etc.

Guidelines to the Paper Setter

- **Six questions are to be set from unit 1.**
- Students are required to attempt **four questions** in all
- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. Disaster Management Act 2005, Govt. of India.
2. A Comprehensive Handbook on Disaster Management, VHAI
3. Disaster Management and preparedness by Dhawan, NIdhi, 2014
4. Disaster Management by Dr. Pandey, Mrinalinil, 2014
5. Disaster Management by Sinha, Anil, 2014

MASTERS OF ARCHITECTURE- 4TH SEMESTER - 2013
DISSERTATION – 2
MACH - 401

University Exam Marks - 300 (No exam. Only viva-voce by external jury)
Sessional Marks - 200
No. of contact hrs. - 22 per week

INTENT

To promote research, documentation, analysis and its interpretation in the form of an elaborated study.

CONTENTS

The Dissertation will include undertaking a detailed study, carrying out critical analysis, identification of issues involved, documentation and evolving suggested approach/solutions related to subjects prescribed/studies made during the course based on defined and approved research methodologies.

Dissertation can be an extension of study in previous semester or can be a new topic.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues and approaches towards suggesting and providing solution to the area studied.
- Continuous evaluation shall be made of students work based on assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, site visits, literature/ case study etc.

Guidelines to the examiner

External marks shall be awarded through viva-voce conducted by external examiners appointed by the university. The basis of evaluation shall be quality of research carried out, quality of document and solutions proposed/evolved by the students.

Note: The detailed procedure/stages of dissertation must be worked out at the college level to evaluate the sessional work.

MASTERS OF ARCHITECTURE- 4TH SEMESTER - 2013
ARCHITECTURAL CONSERVATION
MACH – 402

University Exam Marks - 50
Sessional Marks - 50
Duration of Exam - 03 hrs
No. of contact hrs. - 04 per week

INTENT
To make students understand the role and importance of heritage/architecture conservation.

CONTENT
Unit-1
- Introduction, intent, content and scope of conservation, preservation, and promotion of built heritage/human settlements in the Indian and international contexts including UNESCO/ Charter of Venice.
- Identification and study of problems, issues involved and solutions available in promoting conservation, preservation and management of heritage/architecture conservation.

Unit-2
- Study and analysis of **available legal framework** at local, state, national level for heritage/architecture conservation in the Indian context.
- Study and critical analysis of **existing Institutional framework** at local, state, national level for heritage/architecture conservation in the Indian context.
- Study of **existing policy framework** available at national/state level for heritage/architecture conservation.
- **Innovative financing** options for heritage/architecture conservation.

Unit-3
- Case studies of heritage/architecture conservation with specific reference to the state of Punjab.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues related to architectural conservation.
- Continuous evaluation shall be made of student's work based on various assignments.
- Teaching shall be imparted through a combination of lectures/case studies by subject experts.

Guidelines to the Paper Setter

- **One compulsory question** is to be set covering the entire syllabus in the shape of short answers.
- In addition, **two questions are to be set from unit 1, four questions from unit 2 and two questions from unit 3**.
- Students are required to attempt **five questions** including compulsory question with minimum one question from each unit.

- Question paper is to be set covering entire syllabus by making parts and mixing the topics

Reference Books:

1. An introduction to conservation by Feildon B. M
2. Conservation of Building by I. H. Harvey
3. A critical bibliography of Building Conservation By Smith I. H.

MASTERS OF ARCHITECTURE- 3TH SEMESTER - 2013
DISSERTATION – 1
MACH - 304

University Exam Marks - 50 (No exam. Only viva-voce by external jury)
Sessional Marks - 50
No. of contact hrs. - 04 per week

INTENT

To promote research, documentation, analysis and its interpretation in the form of an elaborated study.

CONTENTS

The Dissertation will include undertaking a detailed study, carrying out critical analysis, identification of issues involved, documentation and evolving suggested approach/solutions related to subjects prescribed/studies made during the course based on defined and approved research methodologies.

Teaching Methodology

- Emphasis shall be laid on making students understand the issues and approaches towards suggesting and providing solution to the area studied.
- Continuous evaluation shall be made of students work based on assignments.
- Teaching shall be imparted through a combination of lectures by subject experts, site visits, literature/ case study etc.

Guidelines to the examiner

External marks shall be awarded through viva-voce conducted by external examiners appointed by the university. The basis of evaluation shall be quality of research carried out, quality of document and solutions proposed/evolved by the students.