

Syllabus for M.Arch (Ekistics)

Masters of Architecture in Ekistics is an interdisciplinary post graduate program which has been specifically designed to cater to the development dynamics of our ever expanding cities.

The everyday crisis of our cities, lack of systematic approach to urban planning, dichotomy of planning where urban planning schemes are not integrated leading to urban chaos, demands a contemporary inclusive and rational approach in urban and regional planning.

Ekistics being the science of human settlements includes a comprehensive and holistic dimension across the disciplines ranging from the study of settlements and society, demographics, land economics, sociology, environment, legislations, transportation and networks, regional planning and GIS.

The course intends to equip the students with the holistic understanding of our complex, indigenous, old and new city fabrics across the disciplines so that they could play meaningful roles in urban planning, city building and shaping our settlements; ultimately improving the quality of life.

As Doxiadus says – *the ultimate goal of a human settlement is to satisfy the needs of its inhabitants, and of the other it serves – particularly those needs leading to happiness and safety.*

EK- 101:**Ekistics and Ekistics Matrix**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the emergence and scope of ekistics and its need in shaping the Human Settlements.

METHODOLOGY: Lectures supported by Library Studies and Presentations.

CONTENTS:

Ekistics as a discipline dealing with Human settlements in totality

Origin and development of Ekistics as lead discipline for Human Settlement

C.A Doxiadis:

C.A. Doxiadis as the pioneer of Ekistics

Influences from Central Place Theory and its Biological Analogy

Early works of Doxiadis.

Elements of Ekistics

Doxiadis Definition of Ecumenopolis

Land Use- Doxiadis 12- Zone proposal

Ekistics Matrix:

Anthropocosmos Model

Ekistics Units and Ekistics Grid

Synthesis

Ekistics Synthesis of Structure and Form

EK- 102:**Study of Society**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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The objective of the course is to create an understanding of the reproduction of contemporary culture in the post-colonial city resulting from interdisciplinary participation drawn from Sociology anthropology to Culture Studies.

Meaning and Concept: Understanding Cities

- Classical Sociological Approaches
- City as a human network – Social Structures and urban form.
- Contemporary Culture – Community and Solitude: Social Relations in City:- The Metropolitan Experience.
- Cities in Quarters

City Spaces:

- Concept of place and Space-Social Construction of space.
- Space as contested domain
- Spaces of Modernity vs spaces of Social Justice post-modernity and the city
- Space to Place

Cities of differences: Inequality, Marginalization and Fear

- The politics of urban difference: Consensus to conflict
- Social Justice and the 'urban question'
- Gender in the city
- New divided city?
- Global trends and local diversity
- Discoveries and implication of the post-metropolis, globalization and transnational Urbanism.

**EK- 103:
Analysis****Demographics and Land Data**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the demographic profile and spatial information of settlements and to study the various aspects of Land Economics

METHODOLOGY: Lectures and Field Study

CONTENTS:

Spatial Information: City Overview, Zonal details, Road Network, traffic volumes, approaches for spatial planning. Graphic Data and Non Graphic Data

Surveys - Analysis and research, Primary and Secondary Data. Census, Analysis of Census data

Demographic Profile of Settlements: Studies based on Age, History, Household Types, Diversity, Employment, Population, Income, Land Use and Location

LAND ECONOMICS

Economic concepts of Land; Objectives and scope of Land Economics – its relevance to spatial planning; Land as a Resource/Commodity and its role in urban development; Economic principles of land use; Demand forecasting for land use; factors affecting land supply and demand; Land valuation – technique, land pricing, subsidies, auction;

Land Information System: Land Records, Transparency in land transaction, methods of publicizing land prices and land price monitoring; Land Policy and Land Markets, Development of Land and Real Property; valuation of real property – principles and practices; private ownership and social control of land; Land price behavior in Metropolitan cities in India;

Factors influencing Locational decisions – like residential, commercial, institutional etc., in the light of location theories. Techniques of Cost Benefit Analysis; Urban Land Management and Land Reforms.

EK- 104: Environment & Management of Natural Resource

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the important natural resources available to the mankind and their effective management for a sustainable development. To understand the methods for environmental impact assessment and mitigation measures. The course will provide practical opportunities for students to participate in reviewing and critiquing actual environmental impact statements, as well as to use various assessment methods

METHODOLOGY: Lectures and presentations

CONTENTS:

Natural resources, Classification of natural resources, Resource Appraisal, resource problems and sustainable development. Ecological footprints and carbon credits.

Renewable and Non Renewable Resources.

Forest Resources: Types, uses and management, world Forest Cover, Forest Resources of India, Afforestation, deforestation and Sustainable Forest management.

Water Resources: Worldwide Scenario, Indian water Resources, Hydrological cycle, Surface water, Ground water, Flood, drought. Managing water resources. Current water related issues of India.

Energy Resources: World Energy demand, Sources of Energy- Solar, Geothermal, Hydel, Tidal, Hydrogen, Biomass and Nuclear Energy

Land Resources: Land as a Resource, Soils, Types of Indian soils, land Degradation, Soil Degradation, Soil Degradation- Causes, Indian scenario, Soil Conservation

EK- 105: Evolution & Development of Human Settlements

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the Evolution and Growth of Human Settlements with a critical appreciation to draw inferences for application.

METHODOLOGY: Lectures and Library Studies

CONTENTS:

Origin and Growth of Human settlements, River Banks as a carrier to growth of Human settlements

River valley Settlements: Greek, Roman, Medieval, Renaissance and modern

Classification of Settlements: Informal and Formal, Open and Walled, Feudal and Democratic, Organic and Inorganic, Irregular and Geometrical, Magical and Mystical, Medieval and Classic

India:

Human Settlements during Ancient, Medieval and modern Periods

Characteristics of Human Settlements built under ancient & medieval period

Study of Ancient Settlements like Mohenjodaro, Taxila and Nalanda, Hampi, Madurai etc.

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OBJECTIVE:

The Objective of the studio subject is to learn and develop understanding of the human settlements and to get introduced to settlement planning through study of five principles of Ekistics Theory by C.A Doxiadis.

Studio allows students to achieve experimentations and indepth inquiry in field of ekistics for a living settlement at small scale (Group of Neighbourhoods, Urban Village , Ghettoes etc.)

To help in developing an understanding of different typologies of buildings and public spaces , which makes a settlement work.

METHODOLOGY: Lectures, Studio exercises, Public Meetings and Field Study

CONTENTS:

1.) Area Appreciation of chosen case study in an Urban area having both planned and unplanned elements at small scale (Group of Neighbourhoods, Urban Village , Ghettoes etc.) Through a detailed indepth enquiry of following through secondary and primary sources with understanding of five principles of Ekistics.

a.) Morphology and Evolution

- b.) Social and Physical Boundaries
- c.) Building Typologies
- d.) Social and Physical Infrastructure
- e.) Daily life chores in relation to community or cultural groups (Society).
- f.) Legislative aspects as per Master Plan.
- g.) Environmental Considerations.
- h.) Demography Etc.

2.) Generating an Ekistics Solution for the chosen living settlement of similar scale as mentioned above with people centric approach and involving community participation after doing the above mentioned documentation and research while addressing local issues generated at both physical and social grounds in the settlement through people's perspective.

EK- 107:**Dissertation**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To give strength the sense of exploration, research and documentation

METHODOLOGY: After orientation classes and Lecture, the student will submit a synopsis of the research project for approval. Each student will be required to complete and submit a report (A4 size-50 pages) based on the research credentials. Various stages of work will be presented in the seminar

CONTENTS:

To emphasize a particular aspect related to versatility and diversity within the discipline of Ekistics.

**EK- 201:
Legislations****Policies &**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the various aspects of Land and environment related laws and Legislative framework in India

METHODOLOGY: Lectures and Field Study

Unit I: Sources of Law, meaning of the term of law, legislation, ordinance, bill, act, regulations and bye-laws; significance of law and its relationship to urban development; Land Acquisition Act, 1894 (with amendment in 1984) – basic concept, procedure for compulsory acquisition of property and determination of compensation; Urban Land Ceiling and Regulation Act, 1976 – objectives, contents and planning implications; Laws relating to Regulation of Building Operation; 73 and 74 Constitution Amendment Acts, 1992.

Unit II: Environmental Protection Act, 1986; The Air (prevention and control of pollution) Act, 1981; Water (prevention and control) Act, 1974 (with amendment); The Forest (conservation) Act, 1980; Wild Life Protection Act, 1972; Biological Diversity Act, 2002

Unit III: Five Year Plans in India – an appraisal

Unit IV: Town & Country Planning Act, DDA Act.

EK- 202:**Land Information Resource System**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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CONTENTS:

Unit I. Introduction. Basic concept of Geological factors in development of landforms. Spatial dimension of landforms. Time scales of landform development. Scope of the study of landforms as a unit of systematic analysis and importance of the study of landforms for Human Settlements .

India as a Mega Diversity nation: Trans- Himalayan Region, Indian desert, Semi-arid regions, Western Ghats, Deccan peninsula, Gangetic Plains, North eastern region and Coastal regions

Unit II. Map Reading and Interpretation of Survey Sheets: conventional symbols, locating points, map projections and classification of maps; scales, section drawing. Aerial photo grammetry: Definition, photo scale, and classification of Aerial photographs, Air photo interpretation key elements, and photo grammetric terminology.

Unit III. Factors controlling landform development; endogenetic and exogenetic forces; concepts of geomorphic cycles; geomorphic agents, definition of weathering, types of weathering physical and chemical, definition of erosion and denudation, cycle of erosion. Evolution of different types of landforms. Glacial, Fluvial, Coastal, Desert. Limestone (Karst) characteristic landforms and formation; swallow holes, resurgence, dry valleys, limestone pavements, bedding planes, joints, clints, grykes, caverns, stalactites, stalagmites and pillars. Landuse in different landforms (farming, forestry, water supply and tourism).

Unit IV. Temperature and pressure belts of the world; heat budget of the earth; atmospheric circulation; planetary and local winds; monsoons and jet streams; air masses and fronts; temperate and tropical cyclones; types and distribution of precipitation; Koppen's and Thornthwaite's classification of world climate; hydrological cycle; climatic change. Importance of interpretation of weather and climate in Settlement Planning.

Unit V. Recognition of landforms resulting from river, ice and marine erosion and Interpretation in terms of urban/rural Landuse patterns.

Suggested Reading

1. A text book of Geology by P.K.Mukharjee
2. Text book of Geomorphology by Thornbury
3. Elements of Photo grammetries by K.K. Rampal

EK- 203:**Transportation Planning**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study role of Traffic and Transportation in shaping the human settlements.

METHODOLOGY: Lectures and presentations

CONTENTS:

Transport system and components, modes of transport, mixed traffic and their role in transportation system, road pattern.

Traffic surveys: formulating objectives, identifying outputs, designing survey formats of traffic surveys; classified traffic volume survey, origin and destination survey, speed and delay survey, road network inventory survey. Methodology for analysis and presentation of field survey data and identification of issues.

Appreciation of importance of parking in Transport System planning, parking characteristics, parking indices, parking surveys, parking space inventory, parking norms and standards, design standard for on-street and off-street parking facilities.

Functional hierarchy of road network system. Capacity of highway, definitions and factors affecting, concept of Level of Service (LOS), road network standards by India Road Congress (IRC).

Traffic circulation, traffic management principles, advantages and disadvantages of various traffic management techniques, corridor management

Public transport system in cities, fares and subsidies, World-wide standards and system selection

Cross sectional elements of highways, road geometry and related planning standards, types of intersections, space standards of urban roads, typical cross section of urban roads.

Travel demand forecasting: stage in transport planning process, transport demand models, trip generation, trip distribution, trip assignment, modal split, formulation of transportation plan on the basis of land use, socio-economic growth.

Special emphasis on transport issues in Indian cities, successful cases of appropriate transport planning and infrastructure design from India and other countries.

Methods of traffic calming in residential areas, planning standards for pedestrian priority zones, planning standards for cycle tracks

EK- 204:**Dynamics of Development**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study the forces of Society, Politics and Economics forming the basis of a prismatic theory leading to the dynamic growth of settlements.

METHODOLOGY: Lectures and Field Study

CONTENTS:

Theory of Demand and supply, Micro and Macro Economies, Industrial and Agrarian Economies, Economies of Scale, Migration, Shift in Labour Pool, Real Estate and Cost Index, G.D.P., G.N.P., F.D.I. , Political Agendas, Policies, Planning and projects

Land Economics

Land as a Resource and Commodity, Land Records, Land Acquisition Act 1897 with recent Amendments, Urban Land Ceiling Acts, Land use and Land Values, Land and real Estate Market, Building Operation & Regulation Act, Five Year plans in India- an appraisal

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To study various techniques of sampling and survey research.

METHODOLOGY: Lectures

CONTENTS:

Module 1: Definitions and Basics of Research Methods

Definition and needs of Research, Scientific research and methods, System approach of research, Levels of research: micro and macro. Major steps in the conduct scientific research, induction, deduction and verification. Selection and formulation of research problems, Reviewing of literature.

Module 2: Research Design and implementation

Approaches in research, developing a method for research; Questionnaire Design, Types of data, Sampling and survey techniques; developing aims, objectives, scope, limitations; and literature research – using library, accessing the Internet

Module 3: Designing Research and Test of Hypothesis

Designing a research, Pre test and pilot study, Synopsis, and components of synopsis, Hypothesis; meaning, importance and different concept, formulation and testing of hypothesis, Tests of Hypothesis, z-test, t-test, F-test, Chi-square test. Lorenz Curve; Correlation and Regression Analysis - meaning, types, importance, methods of measurement.

Module 4: Process of Theorization and Research Compilation

Definition of Concept, Theory and facts, Process of theorization, Research Compilation and report: contents and style, factors in the organization of a research report, writing of foot notes, quoting styles, references, cross referencing and bibliography.

EK- 206:**Studio II**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: This course imparts a proper understanding of the complexities of a settlement like Evolution, Demographics, Environment, Social Infrastructure, Physical Infrastructure.

METHODOLOGY:

- 1.Study of settlement and its Documentation
- 2.Educational Study Trip - On site Study and Data Collection of a Thematic Area/
Diagnostic Study
- 3) Formal Mapping and Analysis of Data collection
- 4) Proposal of development Plan for Human Settlements , Interventions/ Prescriptive Study.

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To emphasize the need for taking up live issues/ problems from the field.

METHODOLOGY: After submitting the proposal and in-depth field study will be conducted, which be assessed at various stages and presented in the form of descriptive report.

CONTENTS:

Research will be field orientated, where a live case study or issues be taken up for in-depth study. The topic shall also be related to Demography/ Land data Analysis

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: Urban rejuvenation is critical to the recycling and revival of certain city areas, the objective of the course is to equip the students to deal with developments in existing cities.

METHODOLOGY: Lectures and Field Study

Historic overview of urban renewal

Development strategies for regeneration of inner city areas, recycling, renewal, etc.

Case studies of urban renewal, adaptive reuse and Brown Field projects in India and abroad

Infrastructure up gradation, economic regeneration, financing and management of urban renewal schemes

CONSERVATION

Introduction to conservation, heritage, concepts of historic zones and world heritage sites

Principles of conservation and successful practices in conservation in India and abroad

Importance of Charters, Archaeological Acts, Conservation Acts and Legislation

Concepts and approaches to urban conservation in India, UK and Europe

Heritage tourism and conservation

Institutional framework for urban conservation in India

EK- 302:**Regional Planning**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To understand the regional planning processes.

METHODOLOGY: Lectures and Field Study

Origin and Evolution of planning, contemporary developments in planning, Context of Regional planning, classification of Regions and Delineation Techniques, Threshold analysis Structure Plans, Master Plans, Zonal development plans, UDPFI guidelines. Land Use, Physical structure and relationship between parts of the city.

Urban and Regional Planning principles and considerations: Urban structure; Urban typology, density and sustainability - spatial types and morphologies related to intensity of use, consumption of resources and production and maintenance of viable communities

Regional planning processes: Identification of plan objectives; collection, classification and analysis of data

Selected case studies in regional development in the Indian context.

EK- 303:**Planning Tools: (Remote Sensing & GIS)**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To gain a basic understanding of the concepts underlying the operation of Geographic Information systems, the analysis of digital images, and the acquisition and use of remotely sensed imagery. Students will also learn how to apply these concepts to real-world data by using GIS, image analysis. Finally, students will explore how these software tools can be applied to spatial anthropological data.

METHODOLOGY: Lab and Field Study

CONTENTS:**Unit-I: Fundamentals of Remote Sensing**

Concept of satellite remote sensing; Types of satellites: Sun-synchronous and geostationary satellites; Platforms and sensors; Stages of remote sensing; Electromagnetic radiation (EMR); Electromagnetic spectrum; Interaction with atmosphere; Interaction with the earth surface; Remote sensing sensors and their characteristics; Spectral signature; Types of resolutions; Satellite data types and their uses: IRS satellites series, LANDSAT series, IKONOS, Quick bird and WV; Remote sensing data acquisition.

Unit-II: Fundamentals of GIS

Basic concepts of Geographic Information System; Concept of geo-informatics; Components of GIS; GIS data formats; Types of data structure: spatial and non-spatial; Vector and raster data structure; Data models: tabular, hierarchical, network, relational, object oriented; Errors and accuracies in GIS; Operations in GIS.

Unit-III: Spatial Data Input and analysis

Methods of data capture and input; Geo-referencing; Projection and datum; Coordinate transformation and resampling; Digitization of maps and satellite images; Generation spatial data base; Attribute generation; Linking spatial and non-spatial data; Generation of thematic maps.

Unit-IV: Manipulation, Analysis and Output

Data manipulation techniques; Spatial data analysis: overlay operations and proximity analysis; Data interpolation: point and line data; Network analysis and suitability analysis; Creation of data base: contours, spot heights; 3 D modeling: digital elevation models (DEM), slope and aspect; Query in GIS; Data output and presentation.

EK- 304:**Networks & Communications**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To understand the importance of Networks and communications and their role in shaping human settlements and vice versa.

MEHODOLOGY: Lectures

CONTENTS:

Water Supply Water requirement for various activities/building types, factors affecting water demand, per capita water requirement and its relationship with population size of settlement, variation in water consumption, seasonal and hourly variation, peak factor, concept of water demand management - Water treatment, various types of water treatment, water storage, pumping, types of water distribution system including, head loss, water flow in pipe network, 'loop' and 'branch' type distribution system - Fire fighting system and its impact on design of water distribution system.

Storm Water Drainage Rainfall pattern, measurement of precipitation, intensity, duration, frequency relationship, rainfall intensity, time of concentration, rainfall formula, runoff, hydrograph, unit hydrograph, rational formula, method for estimation of runoff, rainfall map, surface water, watershed, flood frequencies, flood protection - hydraulic gradient, concept of gravity flow, full flow self-cleaning velocity, souring velocity - concept of watershed management & rain water harvesting, impact of rainwater harvesting on water logging/drainage - rain water harvesting techniques.

Power Supply & Distribution Network for large cities, distance sources, power losses in transmission, power shortages, load optimization and load balancing, three phase supply, need for 3 phase and 2 phase power supply at different voltages, role of substations, isolation of circuits through substation, street lighting, emergency power, metering and cost recovery, safety requirements in respect of power supply and distribution networks.

Transmission Systems Satellite, Internet, Wireless, Fiber Optics, Microwave Television and Video-conferencing, Telecommunications development in India, technology and regulations, Evolution and History.

EK- 305:**Housing**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To understand society at its micro-level and its pattern of interaction within settlements.

METHODOLOGY: Lectures and Field Study

CONTENTS:

Housing comprises of the most important basic unit of SHELL several units in its collective hierarchical structure forms the social fabric in a settlement. It has high interdependence on social and physical infrastructure (at micro-level). Integration of Social infrastructures like basic education, health, etc.

Clustering patterns in traditional communities, pattern of community living, concept of neighborhood living, Radburn and other concepts – modern clustering concepts, density, high density living.

Stratification of settlements, Imbalances in settlements, Changes occurring in the pattern of settlements, Conflicts within settlements, communities based on ethnic groups - life style of different socio-economic groups, resulting in housing demand - environmental factors affecting housing layout, site analysis techniques, criteria for location of plots, various concepts of layout planning, techniques of promoting social interaction - development control for plotted and group housing – organization of open spaces and landscaping.

Detailed study of networks like power, water supply, drainage, sewerage, optimization techniques in layout, - site and services schemes.

Role of housing policy, supply of land, need for special attention for the urban poor, housing requirements of economically weaker sections - housing strategy, need for wide variation in housing stock and a good mix of ownership as well as rental housing in response to mobility – role of housing standards & significance in housing design.

M.Arch (Ekistics)

EK- 306:

Semester III

Studio III

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: To understand the regional planning processes of a selected region .

METHODOLOGY: Lectures and Field Study

CONTENTS :

Selection of Real or Hypothetical project (in real situation) of regional scale.

• Preparation of the comprehensive plan for the Region on the following parameters:

- 1.Region and its context
- 2.Demography and settlement patterns
- 3.Economic activities and employment
- 4.Regional Infrastructure
- 5.Transportation
- 6.Housing and shelter
- 7.Environment, Forest and natural resources.
- 8.Tourism
- 9.Administration and Finance

EK- 307:**Dissertation III**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
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OBJECTIVES: Appraisal of an existing Masterplan of a city.

METHODOLOGY: Each student will be required to submit a proposal, which shall be taken up for in-depth analytical studies and present in the form of a report.

CONTENTS:

A master plan of a selected city is to be examined with a specific focus on various land uses. Identity and explain the objectives of the plan as contained in the master plan pointing out contradiction among objectives, if any. ☒

Identify the direction of growth (physical) and growth potentials (socioeconomic) pointed out in the plan. ☒☒

Submissions of drawings, presentation sheets (A-1) and written report (A-4) is required to be submitted for viva Voce.

EK- 401:**Strategies for Contemporary Settlements**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
|---------------|-----------|-----------|-----------|-----------|-------------------|------------|---------|
| <i>L</i> | <i>ST</i> | <i>IA</i> | <i>WR</i> | <i>VV</i> | <i>TOT</i> | | |
| 2 | 2 | 50 | 50 | - | 100 | 3 | 4 |

Objective: To understand the complexities of settlements and preparation of strategies based on contemporary issues of settlements.

Contents:

Urban settlements and its conditions , Future Urbanism, Inclusive Growth, Process of Urbanisation(Economic ,Social and political functions) , Industrialisation , Feudal Society, Democratic society , Concept of socialism , Limited land stock and issues , Skill base development, Types of Economy, City as labour pool and Urbanism as economic function, Advantages and disadvantages of specific city form in planning settlement, Settlement as living organism, Demand and supply in the context of land use planning, Advantages and disadvantages of mechanical physical planning, Strategies of utilization of natural resources,Quality of life, Transport Orient development .

EK- 402:**Thesis**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
|---------------|-----------|-----------|-----------|-----------|-------------------|------------|---------|
| <i>L</i> | <i>ST</i> | <i>IA</i> | <i>WR</i> | <i>VV</i> | <i>TOT</i> | | |
| 8 | 8 | 200 | - | 200 | 400 | - | 16 |

OBJECTIVES

Thesis must reflect the culmination of the development of the student's understanding about the various elements of Ekistics. The study should be holistic in nature related to versatility and diversity within the discipline of Ekistics.

METHODOLOGY

The student must submit to the department the synopsis of at least two different proposals for approval out of which one would be selected depending on its merit for scope of research.

A guide to supervise the studies will be appointed by the head for each student. Regular progress in studio will be carried in six stages during the research. each stage will have a presentation to the internal jury for thesis.

The stage submissions must be based and supported by detailed analytical studies that lay down the validity of the research and detailed methodology.

Submissions of drawings, presentation sheets (A-1) and written report (A-4) is required to be submitted for viva Voce.

EK- 403:**Advanced Geographical Information Systems (GIS)**

| CLASSES/ WEEK | | MARKS | | | | EXAM HOURS | CREDITS |
|---------------|-----------|-----------|-----------|-----------|-------------------|------------|---------|
| <i>L</i> | <i>ST</i> | <i>IA</i> | <i>WR</i> | <i>VV</i> | <i>TOT</i> | | |
| 2 | 2 | 50 | - | 50 | 100 | 3 | 8 |

Unit - 1: Data Structure and Input

Data structure: Spatial and Non-spatial; Methods of data inputs in GIS domain; Scanning and Digitization of maps and Satellite images, GPS, Electronic data input; Map projections; Datum and Ellipsoids; Data registration.

Unit - 2: Data Models

Spatial data models: Raster and Vector; Data models: Hierarchical, Network, Relational; Object based and Field models; Spaghetti models; Topological models; Triangulated Irregular Network (TIN) model; Conversion of Vector and Raster data; Data Models-Entity Relationship model; Concepts of data bases; Layers and Coverage.

Unit - 3: Spatial Analysis

Spatial data analysis: Uses and Significance; Overlay Operations; Topological overlays: Polygon-in-polygon overlay, Line-in-polygon overlay, Point-in polygon overlay; Logical Operators; Buffering, Interpolation: Network and suitability analysis; Linking spatial and non-spatial data; Thematic analysis; Surface analysis; Raster/Grid analysis; Slope and Aspects: its uses and applications; Topology building; Errors and Accuracies in GIS and their corrections.

Unit 4: Modelling in GIS

Conceptual Models; Single layer and Multi layer operations; Spatial Modeling; Geometric modeling: Calculating the distance between geographic features; Calculating area, length and perimeter; Point pattern Analysis; Surface analysis; Fuzzy Spatial Analysis; Geo-statistical Tools for Spatial Analysis; DEM, DTM, DSM; Query in GIS: Spatial Query; Spatial Simulation Modeling; Spatial decision support system (DSS) modeling.

Books recommended:

- Lo CP & Yeung AKW, 2004. Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi
- Heywood I, Cornelius S, Carver S. 2000. Introduction to GIS. Addison Wesley Longman, New York
- Burrough P.A. and Rachael A. McDonnell. Principles of Geographic Information Systems, 2nd (Ed).
- Burgh P.A (1986) Principles of geographical Information System for Land Resources Assessment, Clarendon Press, Oxford.
- Masood AS, 2006. Introduction to GIS, Allahabad
- Fazal S & Rahman A, 2007. GIS Terminology, New Age International Publishers, New Delhi
- Chang.T.K. 2002 : Geographic Information Systems. Tata McGrawHill
- Heywood.I, Cornelius S, CrverSteve. 2003: An Introduction to Geographical Information Systems. Pearson Education
- John R. Jensen. 2000. Remote Sensing of the Environment: An Earth Resource Perspective, Prentice Hall

