

Course Structure And Detailed Syllabus

For

**Master in Urban and Regional Planning
(MURP)
2022-23**



**DEPARTMENT OF ARCHITECTURE AND
PLANNING
NATIONAL INSTITUTE OF TECHNOLOGY PATNA**

Course structure of Master in Urban and Regional Planning (MURP)

Course Structure of MURP								
MURP (Semester 1)								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credi
1	Core 1	1	AR300106	Planning Theories & Techniques	3	1	0	4
2	Core 2	1	AR300107	Urban & Regional Planning Studio-I	1	0	6	4
3	EL	1	AR300XXX	Elective-I	3	0	0	3
4	EL	1	AR300XXX	Elective-II	3	0	0	3
5	EL	1	AR300XXX	Elective-III	3	0	0	3
6	Lab	1	EAA00102	EAA-Sports/Innovative Project/ NCC	0	0	2	1
7	Lab	1	AR300108	Technical Report Writing Tools	0	0	2	1
Total Semester Credits					13	1	10	19
MURP (Semester 2)								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credi
1	Core 1	2	AR300209	Regional Planning: Theory & Practice	3	1	0	4
2	Core 2	2	AR300210	Urban & Regional Planning Studio-II	1	0	6	4
3	EL	2	AR300XXX	Elective-IV	3	0	0	3
4	EL	2	AR300XXX	Elective-V	3	0	0	3
5	EL	2	AR300XXX	Elective-VI	3	0	0	3
6	Lab	2	EAA00202	EAA-SBM	0	0	2	1
7	Lab	2	AR300211	Seminar	0	0	4	2
8	Lab	2	AR300212	Comprehensive Viva	0	0	2	1
Total Semester Credits					13	1	14	21
MURP (Semester 3)								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credi
1	Lab	3	AR300301	Project	0	0	20	10
Total Semester Credits					0	0	20	10
MURP (Semester 4)								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credi
1	Lab	4	AR300401	Project	0	0	24	12
Total Semester Credits					0	0	24	12
Total (Sem I, II, III & IV)					26	2	68	62

Electives								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credit
				Elective-I				
1	EL	1	AR300112	Demography and Quantitative Techniques	3	0	0	3
2	EL	1	AR300220	Land Markets and Management	3	0	0	3
3	EL	1	AR300222	Urban Systems Dynamics	3	0	0	3
4	EL	1	AR300217	Urban Transport Planning	3	0	0	3
				Elective-II				
1	EL	1	AR300213	Environmental Planning	3	0	0	3
2	EL	1	AR300111	Ecology and Sustainable Development	3	0	0	3
3	EL	1	AR300118	Smart Sustainable Cities	3	0	0	3
4	EL	1	AR300216	Advanced Landscape Design	3	0	0	3
				Elective-III				
1	EL	1	AR300116	Infrastructure Planning	3	0	0	3
2	EL	1	AR300119	Spatial Data Infrastructure	3	0	0	3
3	EL	1	AR300114	City and Metropolitan Planning	3	0	0	3
4	EL	1	AR300115	Advanced Housing and Community Planning	3	0	0	3
Elective-IV/ V / VI(2nd Semester)								
Sl. No.	Group	Se m	Code	Course Title	L	T	P	Credit
				Elective-IV				
1	EL	2	AR300123	Advanced Professional Practice	3	0	0	3
2	EL	2	AR300122	Planning Legislation and Governance	3	0	0	3
3	EL	2	AR300223	Urban and Regional Governance	3	0	0	3
4	EL	2	AR300224	Development Management and Finance	3	0	0	3
5	EL	2	AR300218	Advanced Urban Design	3	0	0	3
				Elective-V				
1	EL	2	AR300113	Settlement System Planning	3	0	0	3
2	EL	2	AR300121	Rural Area Planning and Management	3	0	0	3
3	EL	2	AR300214	Regional Analysis and Programming	3	0	0	3
4	EL	2	AR300215	Metropolitan Regional Planning	3	0	0	3
				Elective-VI				
1	EL	2	AR300225	Remote Sensing and GIS in Planning	3	0	0	3
2	EL	2	AR300117	Integrated Urban Conservation	3	0	0	3
3	EL	2	AR300120	Advanced Disaster Management	3	0	0	3
4	EL	2	AR300221	Resilient Urban Planning	3	0	0	3
5	EL	2	AR300219	Futuristic and Creative Cities	3	0	0	3

Detailed Syllabus of MURP

MURP (Semester 1)

1. Core 1 (Semester 1)

AR300106		L-T-P 3-1-0 4 credits
Planning Theories & Techniques		
Aim: To provide knowledge of planning theories and the techniques involved in spatial planning. Course content: 1. Planning theories - Definition of urban and regional planning - Evolution of planning practice - Theories of urbanisation including linear city, Redburn Pattern, concentric zone theory, sector theory, Ebenezer Howard's Garden city concept, Broad acre city theory, multi-nuclei theory, land use and land value theory of Alonso, green belt concept, neighbourhood unit theory, the region city- Patrick Geddes Concept, the radiant city concept. - Growth pole theory, Central place theory, Weber's theory of location, core-periphery theory, spread and backwash theory, Gutenberg theory. - Contemporary theories of planning, Theories of development, Public choice theory, Grid model/Hippodamian theory, Urban realms model, Core frame model, Bid rent theory. Irregular pattern model. - Advocacy planning, action planning, mixed planning in the Indian context. 2. Development Plans, Planning Process and Planning Standards - Urban development plans: types, scope, various approaches, comprehensive planning, structure planning, system approaches, strategic planning. - Planning process - Goal formation, objective, scope and limitation, planning methodology and case studies, plan-making process. - Spatial standards, performance standards and benchmarks and variable standards. - URDPFI guidelines, zoning regulations and developments controls. 3. Survey techniques and Mapping - Database and data processing for planning (including land use, population, density, infrastructures). - Techniques of preparing Base Maps – Concept of scales, components of various levels of plans (regional, city, zone, local area plans). - Survey techniques and questionnaire preparation.		
Reference Books:		Year of publication
1	Planning Theory, Allmendinger Philip; Palgrave MacMillan.	2017
2	The Oxford Handbook of Urban Planning, Weber Rachel et all, Oxford University Press	2015
3	Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century, Hall Peter	2014
4	Cities of the World: World Regional Urban development, Brunn S.D.et all.	2012
5	Urban and Regional Planning Since Independence: Retrospect and Prospect: Technical papers, National Town and Country Planners Congress, Mysore, Ministry of Urban Affairs and Employment	2012
6	Contemporary Urban Planning, Levy John M, Longman	2011
7	Urban Planning: Theory and Practice, Rao M.P., CBS Publishers	2005
8	City Assembled: The Elements of Urban form through History, Kostof Spiro, Thames and Hudson	1999
9	Arthur Gallion, Simon Eisner; The Urban Pattern: City Planning and Design, Van Nostrand Reinhold.	1986
10	Healey P.; Planning Theory: Prospects for the 1980s, Pergamon Press.	1982

2. Core 2 (Semester 1)

AR300107 Urban & Regional Planning Studio-I		L-T-P 1-0-6 4 credits																		
Aim: This studio provides exposure to urban planning and enables students to understand the context, urban complexities, situations, and emerging issues. The studio intends to introduce the general concepts associated with physical planning and develop the skills of documentation, data analysis, spatial representation and written and verbal communication. These may include the preparation of sustainable development plans, sector specific plans and formulation of strategies for development. It is designed to equip the students to investigate issues and propose development schemes at the small/medium town level, ward level with various methods and required development techniques. The Course contents: After the completion of this course, students will be able to: 1. Explain the parameters that govern the development of urban areas; 2. Recognize urban problems and factors responsible. 3. Prepare comprehensive socio-economic questionnaire for urban planning. 4. Develop land use strategies and concepts for urban areas. Assignment framework: The students will be exposed to the following assignments covered over specific period of time. <table><tr><th>No.</th><th>Assignment Detail</th><th>Duration</th></tr><tr><td>1</td><td>Study to differentiate between an existing planned and unplanned city base on level of infrastructure, services, demography, and governance based on purely secondary data.</td><td>3 Weeks</td></tr><tr><td>2</td><td>Neighbourhood design</td><td>1 Week</td></tr><tr><td>3</td><td>Study of an existing ward based on primary socio-economic, infrastructure and land-use survey. (Group Work)</td><td>4 Weeks</td></tr><tr><td>4</td><td>Redesigning the existing ward studied in assignment 2</td><td>4 Weeks</td></tr><tr><td>5</td><td>Designing a small-scale city.</td><td>2 Weeks</td></tr></table>			No.	Assignment Detail	Duration	1	Study to differentiate between an existing planned and unplanned city base on level of infrastructure, services, demography, and governance based on purely secondary data.	3 Weeks	2	Neighbourhood design	1 Week	3	Study of an existing ward based on primary socio-economic, infrastructure and land-use survey. (Group Work)	4 Weeks	4	Redesigning the existing ward studied in assignment 2	4 Weeks	5	Designing a small-scale city.	2 Weeks
No.	Assignment Detail	Duration																		
1	Study to differentiate between an existing planned and unplanned city base on level of infrastructure, services, demography, and governance based on purely secondary data.	3 Weeks																		
2	Neighbourhood design	1 Week																		
3	Study of an existing ward based on primary socio-economic, infrastructure and land-use survey. (Group Work)	4 Weeks																		
4	Redesigning the existing ward studied in assignment 2	4 Weeks																		
5	Designing a small-scale city.	2 Weeks																		
Reference Books:		Year of publication																		
1	Praja.org. Handbook of Urban laws and Policies that Impact Housing,	2015																		
2	URDPFI Guidelines, Government of India, Ministry of Housing and Urban Affairs	2014																		
3	Gallent Robinson, Neighbourhood Planning: Communities, Networks and Governance, Policy Press	2012																		
4	Various City Development Plans under JNNURM																			
5	Kevin Lynch, Good City Form, MIT Press	1984																		
6	Edmund N. Bacon, Design of Cities, Penguin publishers	1976																		

3. Elective-I: See detailed syllabus of electives for Semester I.

4. Elective-II: See detailed syllabus of electives for Semester I

5. Elective-III: See detailed syllabus of electives for Semester I

6. Lab

EAA00102 EAA-Sports/Innovative Project/NCC	L-T-P 0-0-2 1 credit
Sports Aim: The students are exposed to different sports & physical fitness activities. This course will encourage students to become part of Fit India Movement by inculcating at least 30-60 minutes of physical activities in their day to day lives which bring behavioural changes and move towards a more physically active lifestyle. Course Content: ● Principles of Exercise training to improve physical fitness. ● Concepts of different Sports Sciences. ● Factors affecting physical fitness. ● Means and methods of developing physical fitness components: Circuit training, Resistance training, plyometric training, Fartlek training, Interval training, Core stability training, Cross Fit, Aerobics. ● Planning of Fitness programme and Evaluation of Physical Fitness, ● Phases for Exercise prescription Expected Outcome: Students able to carry a better mental state which reduce risk of depression and anxiety and help to sleep better also get an idea about weight management, reduce health risk, strengthen bones and muscles, improve ability to do daily activities and prevent falls, increase chances of living longer in a better way. Able to impart their knowledge in the field of Sports Sciences. Innovative Projects Aim: The students are encouraged to work on and improve upon their skills in the field of Creativity, Arts and Craft or DIY depending upon their interests. The aim of this subject is not only strengthening their mind and promote better time management skills but also give an opportunity to explore their inherent but unrealized potentials and skills beyond their academic activity. Course content: Best out of Waste: Best out of Waste is a technique / adaptive method which is based on the concept of 3R's of Waste management – Reduce, Reuse and Recycle of the waste in our day-to-day life with potential, and making use of the same. For example, Students can use of jute, sticks, wires, plastic water bottle and thrown. Types in Use or styles: Students have to use waste materials/elements such as plastic/metals/glass etc. for working on the projects. No student shall buy any materials except the glues/tapes from shop for their actual projects. Sketching/Painting/Embroidery: Sketching and Painting, embroidery will include various forms of Arts, techniques and Styles used by artists for painting and sketching. Types in Use or styles: Oil Painting/Water-Colour/Pastel/Acrylic/Charcoal/Pencils/Colour Pencil/Ink Painting/Glass Painting/Types of Embroidery etc. Sculpture making/Pottery: Sculpture making / Pottery will include various forms of portraits, items and use of different materials <i>e.g.</i> Use of Wood, Clay, Stone, Cement, POP (Plaster of Paris) etc. Use of Types of Sculptures/pottery to Show, emotions, feels, art, innovative ideas, Utensils, Bust of various personalities etc. Types in use of Styles: Sculptures in relief, Carved Sculptures; Full-Round Sculptures, Cast Sculptures; Modelling Sculptures; Assembled Sculptures; Installation Sculptures, Kinetic Sculptures. Art and Craft Items: Art and Craft items can be of the Use of Decorations and various ideas in outdoor and indoor beautification. <i>e.g.</i> Use of Papers, ribbons, mount board, thermocol, etc. Types in use of Styles: Origami; Hanging Crafts; Use of wall space; Use of Windows; Use of Entry Doors; Use of wardrobe; Gardening: Gardening is a way to connect with the nature and contribute to the ecosystem. Types in use of Styles: Freestyle Gardening; Planting on tubs, Planting on lawns; Planting on courtyards; Planting on terrace; Planting on Balcony etc.	

Photography: Photography is also a modern way to cater the information, perception and values of humankind & nature, the plight of poor and conditions can also be catered. Students can use DSLR/ Mobile Camera and click City/Village scenario depending on their choice.

Types in use of Styles: Portrait Photography; Photo Journalism; Still Life; Panorama; Wildlife; Architectural; Etc.

DIY: DIY techniques and tools can be handy for busy life and making things simpler & aesthetic. Projects have to be taken by the students depending upon the availability of materials and ideas adopted for different projects.

Specific Projects of students Choice** Depending on interest the students are motivated to work on their specific/innovative idea. Projects have to be taken on their own interest and the students are motivated to bring their Specific Ideas to Concepts.

Students can produce 5 Small Project or 3 Medium or 1 Large level Projects in two areas based on their interests or as guided by their instructor.

Critical appraisal of the innovative projects would be done in three stages:

Stage 1: These stages judge the **creativity** among the students regarding the identification of their interest Area, Students have to focus on Materials and explain in the class regarding their choice of materials/ elements for their selected project.

Stage 2: Second stage judge the student's ability in **Innovation**. In this stage students will describe the Innovation chosen and the working principles with sketches or reports writing. Then they have to explain the utility of their selected project in daily life.

Stages 3: This stage requires **Actual projects and Report** to be submitted by the students. The Real Projects have to be displayed in the class in offline (by pictorial representation and by video call on MS teams in case of Online mode).

Expected Outcome: The expected outcome of the innovative project is to students should learn and apply the scientific base to produce good result related to field of Photography /Gardening/ Art and Crafts/ Sculpture/ sketching /Painting/Embroidery and other creative field depending upon their interests. They should also adopt and the concept of Reduce, Reuse and Recycle in practical life.

Reference Books:		Year of publication
	Sports	
1	Fahey, Insel, Roth; Fit & well (6th Ed.). Boston: McGraw Hill co.	2004
2	Greenberg, Dintiman, Oakes. Physical fitness & wellness (3rd Ed.). IL: Human Kinetics	2004
3	Howley & Franks. Health fitness instructor's Handbook (3rd Ed.) IL: Human kinetics.	1997
4	Williams & Wilkins, ACSM's resource manual for guidelines for exercise testing & Prescription (3 rd Ed.) Lippincott.	1998
5	Durstine & Moore; ACSM's exercise management for person's with chronic diseases & Disabilities (2nd Ed.) IL: Human Kinetics.	2003
	Innovative Projects	
1	Raveesh Agarwal, Mona Chaudhary And Jayveer Singh; Waste Management Initiatives In India For Human Well Being; H16.pdf (iitk.ac.in)	
2	Plastic Waste Management Issues, Solutions & Case Studies; SBM Plastic Waste Book.pdf, 2019	2015
3	William Walker; Handbook of Drawing; Handbook of Drawing (aproged.pt)	1880
4	DAN SCOTT, A BEGINNER'S GUIDE to Painting by; A-Beginners-Guide-To-Painting-Compressed.pdf (drawpaintacademy.com)	
5	Learn & Master Painting with Gayle Levee; LMPaintinglessonbook.pdf (learnandmaster.com)	2009
6	Karl Bitter; The Sculpture Plan; Art hand-book, sculpture, architecture, painting (panam1901.org)	
7	Christie Lovat; Gardening 101; https://www.mcgill.ca/hr/files/hr/gardening_101.pdf	
8	Robin Mittenthal; Up from the Ground; garden_manual_v_1.1 (eagleheightsgardens.org)	2007

9	Basics of Hand Embroidery, NCERT; ievh101.pdf(ncert.nic.in)	
10	Embroidery for Beginners; Embroidery for Beginners PDF - Textile eBook	
11	Introduction to photography; https://carleton.ca/healthy-workplace/wp-content/uploads/Intro-to-Photo-presentation-20112.pdf	
12	David Capel; Basic principles of photography vision.cse.psu.edu/courses/CompPhoto/PhotoIntro.pdf	

7. Lab

AR300108		L-T-P 0-0-2 1 credit
Technical Report Writing Tools		
Aim: Students would be acquainted with the tools and techniques involved in technical report writing. To make them better understand its importance in the field of Architecture and Planning, students will be familiarised with - the Meaning of Research, Research Methods, Measurement, Scaling Techniques, Method of Data Collection, Data Processing and Analysis. Course content: I. Tools and Techniques of Report Writing: Meaning of Research, Structure of Research Report: Preliminary Pages: Title, Abstract, Table Contents; Body of the Report/Paper: An Introduction, Review of Literature, Gaps Areas in Research, Objective of the Study, Methodology, Hypothesis Testing, Empirical Finding and Interpretation, Conclusion and Summary. End Pages: Questionnaire, Sample Information, References/Bibliography, Indexes. Significance of Tables, Footnotes or Endnotes, Citing Articles, Reports, Papers, and other materials. Plagiarism, Proofreading, Technical Guidelines to Writing. II. Research Methodology: Meaning, Objective and Types of Research; Research Approaches; Research Methods versus Methodology; Research and Scientific Method; Defining the Research Problem: Selecting the Research Problem; Necessity and Techniques of Defining Research Problem. Research Design: Meaning, Need, Features and Significance; Types of Research Designs; Designing Flow Chart of the Methodology. Sampling Design: Meaning of Census and Sample Survey, Steps in Sampling Design, Criteria of Sampling Procedure; Types of Sample Designs and its application. III. Measurement and Scaling Techniques: Importance of Measurement, Types of Measurement Scales, Technique of Developing Measurement Tools, Significance of Scaling, Scaling Techniques and its Construction. Methods of Data Collection: Primary Data Collection: Observation Method, Interview Method, Visual Methods, Participatory Method, Data Collection through Questionnaires/Schedules, Secondary Data Collection: Case Study Method. IV. Processing and Analysis of Data: Processing of Data, Spatial Data: Creation, Collection and Analysis; Statistics in Research: Measures of Central Tendency and Dispersion, Measures of Asymmetry and Relationship, Correlation and Regression Analysis, Advance Statistical Analysis. Interpretation, Report Writing and Communicating Research Papers: Interpretation, Techniques of Interpretation: Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report. Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports. Techniques of Writing Research Papers and Communication in Architecture and Planning.		
Reference Books:		Year of publication
1	Pandey, P. and Pandey, M.M. Research Methodology: Tools and Techniques, Bridge Center, Romania https://www.euacademic.org/BookUpload/9.pdf	2015
2	B. Riorvan; Technical Report Writing Today; Cengage Learning.	2013
3	Krista Van Laan; The Insider's Guide to Technical Writing; XML Press	2012
4	Creswell, J. Research design: qualitative, quantitative, and mixed methods approaches. Thousand Oaks, CA: Sage. H62.C6963 2009	2009
5	Wang, X, vom Hofe, R. Research Methods in Urban and Regional Planning, Springer-Verlag Berlin Heidelberg.	2007
6	Barry J. Rosenberg; Spring into Technical Writing for Engineers and Scientists: The Smart Professional's Choice; Pearson Education	2006
7	Kothari, C.R.. Research methodology: Methods and techniques. 2nd revised edition New Delhi: New Age International (P) Limited, Publishers	2004
8	Bickel, P. J., & Doksum, K. A. Mathematical statistics: Basic ideas and selected topics (2nd ed., Vol. 1). Paramus, NJ: Prentice Hall.	2000

MURP (Semester 2)

1. Core 1(Semester 2)

AR300209		L-T-P 3-1-0 4 credits
Regional Planning: Theory and Practice		
Aim: To create awareness about theories of regional planning and their application. Course content: 1. Spatial Planning in Regional Context - Concepts of region: Defining a region: fluidity and purposiveness, Typology of Regions: Resource Regions, Mega, Macro, Meso, and Micro Regions. Delineation of Regions (Regionalization). National, Sub-National, State, and District as a region. - Mega and metro region, Urban Sprawl, Core, Fringe and Periphery in a Region and its planning, extended urban region: Scale, Complexity and its impact on national and international scenario. - Regional development theories. Growth and Development, Efficiency, Equity, marginality, and Sustainability in region. Regional Development Authorities in India. - Regional connectivity and corridors: Sagarmala Programme, Golden Quadrilateral, Delhi-Mumbai, Chennai-Bangalore Industrial Corridor, North-South and East-West Corridor etc. 2. Futuristic Regions - Introduction to Futures perspectives and methods, Technological advancement and emerging future regions, Rapid Economic changes and future engines of growth, Regional Demographics including regional migration pattern, Concept of Ecological Footprint, Introduction to Ecological Economies, Sustainability Concepts and Practices, Climate Change, Globalization and emergence of seamless regions, Futuristic regional connectivity (Hyper loop, High speed rail, etc.) Policy Changes and its impact on future regions. 3. National Planning Framework - National planning framework and general approach in India. - Philosophy and status of regional planning, Five years plan, 20 point programs, MDG, SDG, sectoral, multi-level and integrated approach of planning, national policies on income distribution and provision of minimum basic needs. - Regional economy and planning: approach for capitalism socialism, and communism. Planned and unplanned economy, Competitiveness among regions, Forward and backward region and its development. 4. Regional Analysis - Regional analysis tools and techniques and its applicability to India; Growth pole and growth center strategies, economic base theory. - Threshold analysis, input-output analysis, SWOT analysis, Guttman scalogram analysis, linear programming techniques of system simulation, Grain Lowry Model - Methods of population forecasting and projections - Lorenz curve, Ginni coefficient and ratio, Theil's index 5. Techniques of target fixation - Techniques of target fixation in regional development inter-sectoral co-ordination. - Formulation and phasing of implementing the perspective plan regional plan, development/master plan, and integrated area development plans for any region 6. Case Studies - Case studies: NCR and Delhi Mega Region, Mumbai Mega Region, Kolkata Metro Region, Chennai Metro Region, and other Metro Regions in India. Western and Eastern Ghats, North Eastern Region, Coastal Regions, and River Valley, Corridors etc.		
Reference Books:		Year of publication
1	Location Theory and Decision Analysis: Analytics of Spatial Information Technology, Chan Yupo, Springer	2017
2	Chandna R.C.; Regional Planning and Development: Kalyani Publishers.	2016
3	MoUD.; Regional Planning Approach, URDPFI vol. I and Vol.2.; New Delhi	2014
4	Walter Isard , Iwan J. Azis , Matthew P. Drennan , Ronald E. Miller , Sidney Saltzman , Erik Thorbecke ; Methods of Interregional and Regional Analysis; Routledge.	1998

5	Misra R. P., Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing Company.	1992
6	Nijkamp, P. and Delft, A. V.; Multi-Criteria Analysis and Regional Decision-Making; Leiden: Martinus Nijhoff Social Sciences Division.	1977
7	Glasson, J., An Introduction to Regional Planning, London: Taylor and Francis ltd.	1974
8	Flittie Edwin G., The Delineation of a Region- An Alternative Technique, Wiley Online Library	1970

2. Core 2 (Semester 2)

AR300210 Urban & Regional Planning Studio-II		L-T-P 1-0-6 4 credits
Aim: This studio provides exposure to urban planning and enables students to understand the context, urban complexities, situations, and emerging issues. The studio intends to introduce the general concepts associated with physical planning and develop the skills of documentation, data analysis, spatial representation and written and verbal communication. These may include the preparation of sustainable development plans, sector specific plans and formulation of strategies for development. It is designed to equip the students to investigate issues and propose development schemes at the small/medium town level, ward level with various methods and required development techniques. Assignment framework: The students will be exposed to the following assignments covered over specific period of time. 1. Integrated plan for urban region, including 2 weeks field survey. 2. Theories and principles of urban development plan and preparation for survey and data collection. 3. Field survey of the study area. 4. Analysis of data and information 5. Planning for urban area and its region (structure plan/Development plan) with emphasis on: • Land use and transportation network • Infrastructure plan • Action area programs and urban renewal plan • Capital budget and financing • Administrative and management backup for implementation		
Reference Books:		Year of publication
1	Praja.org. Handbook of Urban laws and Policies that Impact Housing,	2015
2	URDPFI Guidelines, Government of India, Ministry of Housing and Urban Affairs	2014
3	Gallent Robinson, Neighbourhood Planning: Communities, Networks and Governance, Policy Press	2012
4	Various City Development Plans under JNNURM	
5	Kevin Lynch, Good City Form, MIT Press	1984
6	Edmund N. Bacon, Design of Cities, Penguin publishers	1976

3. Elective-IV: See detailed syllabus of electives for Semester 2.

4. Elective-V: See detailed syllabus of electives for Semester 2.

5. Elective-VI: See detailed syllabus of electives for Semester 2.

6. Lab

EAA300202	L-T-P
EAA-Swachch Bharat Mission	0-0-2
1 credit	
1. Understanding the Swachch Bharat Mission (SBM): Introduction to Swachch Bharat Mission (SBM), Swachch Bharat Mission–Urban, Swachch Bharat Mission –Rural. Objective of the Mission, Components of the SBM, Earlier Sanitation Campaigns in India, Performance Monitoring of SBM Activities. Swachch Bharat Mission (SBM), Phase I -2014-2019, Swachch Bharat Mission (SBM), Phase II -2014-2019. Achievement SBM - Phase I and SBM-Phase II. Swachhta Pakhwada 2. Innovative ideas for Implementation of SBM: Exploration of Diverse ideas for achievement of different objectives of SBM: Research Oriented Exercises for the Students for example, Converting Waste into Energy, Introduction to SWACHH BHARAT MISSION (SBM) CARD, Installation of Plastic ATM, Plastic Waste as building material for road construction, Zero Waste Lifestyle, Learning from the Top Ranker Cities and Towns under Swachh Survechan Competition 2020-21. 3. Introduction to ‘ZERO WASTE’ Concepts and Its Implementation: Introduction to ‘ZERO WASTE’ Concepts and its Implementation at household Level: Activity Oriented Exercises. 4. Ecobricks making competition, Ideas for Street furniture from the Plastics* etc. (This unit is activity-oriented exercise for the students for e.g. Students participate in Ecobrick making Competition, Designing of Street furniture from waste plastics etc.). 5. Locality Survey regarding the implementation of SWM: (This units include the Survey of the Locality regarding the implementation of SBM using Schedules/questionnaire, Data Collection, Data Analysis and Report preparation)	

7. Lab 2

AR300211 Seminar	L-T-P 0-0-4 2 credits
The objective of seminar is to provide an opportunity to each student for an intense study of one topic and write term papers and make oral presentations of the topic of their choice.	

8. Lab 2

AR300212 Comprehensive Viva	L-T-P 0-0-2 1 credit
The objective of comprehensive viva is to conduct a system-based evaluation and assessment of broad-based learning and behavioural outcomes. This shall include all aspects of students' growth and development.	

MURP (Semester 3)

1. Lab (Semester 3)

AR300301		L-T-P
Project		0-0-20
		10 credits
Aim: To make the students understand the process of carrying out research and to effectively programme the thesis for the fourth semester. Topics related to various aspects of Urban and Regional Planning and allied subject would be chosen in consultation with faculty members. Emphasis must be on critical understanding, logical reasoning and structured writing. Course content: 1. Introduction, definition, objectives of research, types of research, research process 2. Collection of primary data, data tabulation, and analysis, to draw inferences. 3. Topics related to various aspects of Architecture and allied subject would be chosen in consultation with faculty members. Emphasis must be on critical understanding, logical reasoning and structured writing. 4. Research design and method formulation, selection of tools for research, data collection and management, case studies, site survey and mapping data analysis for the selected topic. 5. Writing and communication skills for written and oral presentations; professional communications. Comprehensive study and research on chosen topic, presentation of findings in a series of seminars by individual students. Documentation and formal presentation as a Dissertation at the end of the semester. The outcome paper would be of 3000 to 4000 words with Standard referencing conventions and technical writing norms. Outcomes: Students finishing this course will be able to comprehend the data collected which may be useful for further thesis; Analyze the focus of research carried out further in the thesis.		
Reference Books:		Year of publication
1	Raiyani, J.R; Research Methodology-Theory and techniques; New century publications.	2012
2	Borden, I. and Ray, K. R.; The dissertation: an architecture student's handbook. 2nd Ed; Oxford: Architectural Press.	2006
3	Murray, R.; Writing for academic journals; Berkshire: Maidenhead. Open University Press.	2005
4	Kothari. C.R.; Research Methodology; New Delhi , New age International Publisher.	2004
5	Anderson, J. and Poole, M.; Thesis and assignment writing. Brisbane; John Wiley.	1998

MURP (Semester 4)

1. Lab (Semester 4)

AR300401 Project		L-T-P 0-0-24 12 credits
Aim: To develop independent critical thinking and design/research abilities and apply the knowledge gained, skills developed and professionalism inculcated over the last three semesters in an exercise of own interest and significant complexity. Course Contents: The thesis project is to be undertaken independently by each student on a topic of his/her choice related to urban and regional planning, selected and approved by the faculty during the previous semester. The student is expected to go through a process of documentation, analyses and synthesis related to his/her specific topic and related area of work. 1. Finalisation of the topic for thesis 2. Development of research thrust and work methodology 3. Selection of study area 4. Collection of data for preparation of base map 5. Project area study/analysis 6. Study of relevant case studies and literature for determination of the space programme. 7. Details of study on main issue/objectives 8. Analysis and findings/results of study 9. Discussions, inferences, conclusions and recommendation/design proposals etc. The student is required to work under the guidance of a supervisor allotted by the department and complete the requisite work in the course of the semester, ending in a viva-voce exam by a panel of examiners both external and internal. The student is required to defend his thesis through drawings, reports, study sheets, models and digital presentations and verbal communications in all the reviews and the final viva-voce.		
Reference Books:		Year of publication
1	John Biggam; Succeeding with Your Master's Dissertation: A Step-by-Step Handbook; Open University Press, McGraw Hill Education, UK.	2015
2	Elizabeth A. Wentz; How to Design, Write, and Present a Successful Dissertation Proposal, Sage Publications.	2013
3	Murray, Rowena; How to Write a Thesis; Open University Press, McGraw Hill Education, UK.	2011
4	Tayie Sami; Research Methods and Writing Research Proposals; Pathway to higher Education, Cairo.	2005

Detailed syllabus of elective subjects offered in MURP in Semester 1

Elective-I (Semester 1)

	AR300112 Demography and Quantitative Techniques	L-T-P 3-0-0 3 credits
	Aim: To make students proficient in Demography and Quantitative Techniques. Course content. 1. Settlement and Demography. Settlement types, growth pattern and structure: urban settlement analysis, Concentration: spatial, vertical and size, peri-urban sprawl, economic base; Rural Settlements – Size, occurrence and character, transformation, Policies towards various size class settlements. Significance of Demography and Statistics in Spatial Planning. Sources of demographic data in India. 2. Demographic Methods: Population structure and composition – Age, sex, gender, marital status, caste, religion, literacy level etc.; Age - sex ratio, structure, pyramid; dependency ratio; occupational structure; fertility; mortality, migration analysis, natural growth of population, migration and its implications in spatial planning. 3. Sources of demographic data: Sources of demographic data - census, registration of vital events. Rates and ratios. Measures of mortality. Life Table - construction and applications. Stable and stationary population. Measures of fertility and reproduction. Standardization of vital rates. Population growth curves, Use of demographic data for policy formulation. Population projection Methods, Population Estimates and Projections. Measures of migration. 4. Introduction to Statistical Methods: Statistical Data. Types of Data, Nominal, Ordinal, interval and Ratio. Descriptive Statistics Tabulation, Variables, graphical representation, measure of Central tendency, dispersion, and Skewness. Standard deviation. 5. Statistical Applications: General concepts. Statistical inference, population and samples variables, Sampling, simple statistical models, Measures of central Tendency, Measures of Dispersion, Measures of shape of distribution, Correlation and Regression, Advance Statistical Methods	
	Reference Books:	Year of publication
1	Pollard, A. H.; Demographic Techniques; Pergamon, Sydney.	1981
2	Gupta.S.C.; Fundamental of Statistics; Himalayan Publishing House, New Delhi.	2004
3	Alho, J., and Spencer; Bruce Statistical Demography and Forecasting; Springer-Verlag New York.	2005
4	Wang, X, vom Hofe; Research Methods in Urban and Regional Planning; Springer-Verlag Berlin Heidelberg.	2007

Elective-I (Semester 1)

AR300220		L-T-P
Land Markets and Management		3-0-0
		3 credits
1. Introduction to Land Economics: a) Definition of Land and its terminology: Land scaping, measurements, Land Resource, Conversion of Land, Land Degradation, Land Maps b) Factor of production: land, labour, and capital. Definition of land. Economic Principles of Land use, Concept of Rent and its application, Demand forecasting for land, factors affecting land supply and demand; interpretation of Revenue Maps (Cadastral maps), Khashara Map. 2. Land Policy and Land Markets: a) Land reforms in India, LA act 1894 and 2013 b) Market Conditions: formal and informal, legal and illegal. c) Instruments of land policy and impact on markets: Planning instruments, market development instruments, financial development instruments, fiscal instruments, and other supportive instruments: Market by Government and Government by Markets: Regulation, monopoly power and its use, private development. d) Rent-seeking and its impact on land supply, access to land by various segments of population, and PPP in land; Introduction to Resettlement and Rehabilitation (R&R). 3. Supply Side Management: a) Right to property (article 300A), Fundamental right (article 12-35), Directive Principles of State Policy (article 36-51). Property Rights: ownership, user and exchange rights: Its implication on land supply; Land Development: Type, cost, methods of disposal; Corruption and land markets: Corruption, black money and land markets; Relation between land, share and gold markets. b) Regulation in Land Markets: Foreign Exchange Management (Acquisition and Transfer of Immovable Property in India), RERA, Social justice and land distribution: public domain, social democratic regulation, corporatist regulation, collective action of the state and regulation of its supply of land – overall impact of regulation on land prices: Master Plan, Zoning and other planning regulations and their impact on supply. c) Land Utilization: National Land Utilization Policy. Types of land utilization and its relevance to planning. Land conversions and its regulation/facilitation in peri-urban areas. Land utilization analysis. Common property and its use, tenancy and ownership, holding size and its relevance, irrigated and non-irrigated and land values. Sources of information for land information. d) Land Management Techniques: Land Acquisition, Land pooling/Readjustment and plot reconstitution, Guided land development. Private land assembly, co-operatives in land development, FDI in land development, land policy, Transfer of development rights, land sharing and land lease. 4. Demand side Management: Income elasticity of land, business cycles and its impact on demand for land, externalities and internalities in land development and induced demand, economic growth and demand for land; Changes in tastes and preferences and its effect on type of land; Poor and their demand; Physical, fiscal, financial and legal incentives for inducing or restricting the demand for land; Mega investments and its effect on land. 5. Land Pricing: Land valuation techniques, land pricing, subsidies, auctions; type of development: plotted, flatted system, and their effect on land pricing; Hedonistic pricing; land price behavior; constructing the land price index. 6. Land Information System (LIS): Case studies of The Gujarat model, Karnataka, Andhra Pradesh, Haryana and others.		
Reference Books:		Year of publication
1	Raleigh Barlowe, Soji Adelaja, and Paul Babladelis; Land Resource Management: Economic Foundations and New Directions; Michigan State University.	2013

2	Ian Williamson, Stig Enemark, Jude Wallace Abbas Rajabifard; Land Administration for Sustainable Development; ESRI Press Academic, Redland, California, First edition.	2010
3	Somik V. Lall, Mila Freire, Belinda Yuen, Robin Rajack, Jean-Jacques Helluin; Urban Land Markets-Improving Land Management for Successful Urbanization; Springer Netherlands, First Edition.	2009
4	David E. Dowall ; The land market assessment-A new tool for urban management; World Bank.	1995

Elective-I (Semester 1)

AR300222		L-T-P
Urban System Dynamics		3-0-0
		3 credits
Aim: To create awareness about system dynamics, its approach to urban planning, simulation techniques in urban dynamic model and its application in different urban systems. Course content: 1. Basic concepts of Urban System Dynamics: The nature of systems; simple and complex, represent real-world systems; nonlinear, dynamic system; interdisciplinary systems; mental models and simulation models; Sources of information. 2. System Dynamics Approach to Urban Planning. 3. Applications of system dynamics in urban areas and the systems withing the urban system. 4. Study and simulation techniques of Urban Dynamic Model (UDM). 5. System Dynamics Modelling for Urban Sustainability: System Dynamics (SD), the quantitative dimension of Systems Thinking, the key principles and essential tools. 6. System Dynamics Model of Urban Transportation System and Its Application.		
Reference Books:		Year of publication
1	Jason Papathanasiou, Georgios Tsaples, Anastasia Blouchoutzi; Urban Sustainability: A Game-Based Approach; Springer.	2021
2	Maha Al-Zu'bi, Vesela Radovic; Sustainable Cities and Communities Towards Inclusive, Safe, and Resilient Settlements, Emrald publishing.	2020
3	Timms, B. S., Guerin, D. R., Arnold, M. R., & Vaudreuil, M. P.; System dynamics computer simulation Modelling to forecast the energy demands for the Montachusett region under a variety of simulations and scenarios. Montachusett: Worcester Polytech Institute Digital WPI.	2011
4	Schroeder WW, Sweeney RE, Alfeld LE; Readings in urban dynamics, vol II. Wright Allen Press, Cambridge.	1975
5	Forrester JW; Urban dynamics. Pegasus Communications, Waltham	1969

Elective-I (Semester 1)

	AR300217 Urban Transport Planning	L-T-P 3-0-0 3 credits
	1. Transportation Planning: Principles of transportation planning; Transportation systems; technological characteristics of transport modes and systems; the nature of demands and supply of transport services, travel demand forecasting. 2. Urban land use-transportation inter-relationships; Economic Theory of Land Price and Land Use; Lowry's Model of Metropolis. Comprehensive Mobility Plans; Transportation Planning Surveys; Planning considerations for goods transportation; Urban Freight Management. 3. Traffic Engineering: Principles of traffic engineering; Methods of conducting traffic surveys and forecasting. Methods of conducting Parking surveys, policies and mechanism. Traffic flow characteristics; traffic analyses and design considerations; design of roads, hierarchy of roads and levels of services; Design of intersection; traffic signals and street lighting; local area traffic management. Traffic and transportation safety and traffic laws; Best Global Practices of traffic and transportation planning projects. 4. Government transport policies: National Urban Transport Policy; Non-Polluting mode of Transportation; Government transport policies and evaluation of transportation proposals; Mass transportation in urban environment such as MRTS, LRTS, ELRTS, BRTS etc., Environmental impacts of traffic and energy issues in transportation. Transit Oriented Development	
	Reference Books:	Year of publication
1	D. Johnson Victor, S. Ponnuswamy; Urban Transportation: Planning, Operation and Management; Tata McGraw-Hill Education.	2012
2	A K Jain; Urban Transport: Planning and Management; APH Publishing.	2009
3	Michael Meyer, Eric J Miller; Urban Transportation Planning: A Decision-Oriented Approach; McGraw-Hill.	2001
4	L.R. Kadiyali; Traffic Engineering and Transport Planning; Khanna Publications.	1999
5	C. S Papacostas, P. D Prevedouros; Transportation Engineering and Planning; PHI Learning.	1992
6	John Black; Urban Transport Planning: Theory and Practice; Routledge	1981
7	Principles of Urban Transport Systems Planning: B. G. Hutchinson: Publisher: Scripta Book Company.	1974

Elective-II (Semester 1)

AR300213		L-T-P
Environmental Planning		3-0-0
		3 credits
Aim: To provide knowledge of environmental planning to prevent degradation and depletion of environmental resources. 1. Environment Planning Techniques: Environmental surveys: Methods of data collection, interview techniques, analysis. Database for incorporation of environmental concerns in planning analysis. 2. Ecological Principles in Planning: Concepts and relevance of Environmental Planning, Integrated resource planning approach, Preparation and analysis of resource inventories and resource matrices, Resource regions in India, their problems and potentials, Sustainability, and environmental criteria for location of human settlements, Ecological parameters for planning at different levels: site planning, settlement planning and regional planning, Carrying Capacity Based Planning- Concept, Parameters, and Indicator Measures; Models and Case Studies in Urban and Regional Development 3. Techniques of resource protection and conservation: land suitability analysis, carrying capacity, and vulnerability analysis. 4. Environmental Resource and Assessment: Resources type, scale, inventories. Resource Assessment – Land – topographic analysis, Water – quality standards, Air and Noise – quality standards, Biodiversity – basics of flora and fauna diversity assessment. 5. Environmental Quality Methods of addressing environmental quality. Environmental Impact Assessment – an introduction. EIA notification as related to human settlement planning. 6. Initiatives towards Environmental Planning in India: Environmental Atlas of India, Siting of Industries, Industrial Estate Planning, Eco-Industrial Estates, Environment Management Plans (EMPs) for urban areas, Eco-Cities, Urban Environmental Information System, Case Studies. 7. Environmental Quality and Policies: Methods of addressing environmental quality, Environmental impact assessment, EIA notification as related to human settlement planning, Integration of EIA methodology to the planning and development processes, Indicators of environmental quality assessment; National Environmental Policies; Environmental protection in urban areas, coordination and enforcement, legislative aspects, population control, technological aspects. 8. Environmental Legislation: Evolution of Environmental Laws in India. The first environmental law; National Environmental Policy – Pollution control Acts - Water (Prevention and Control of Pollution) Act 1974; Air (Prevention and Control of Pollution) Act, 1981; Environment (Protection) Act 1986 , as amended to date; NOC's and Authorities which grant NOCs; Noise (Pollution, Regulations and Control) Rules, 2000;; Municipal Solid Wastes (Management and Handling) Rules, 2000; Biomedical Waste (Management and Handling) Rules, 1998; General Standards for discharge of environmental pollutants; Hazardous Wastes (Management, Handling and Transboundary) Rules, 2008; E-waste (management and handling) rules, 2012; The Batteries (management and handling) rules, 2001; Wetland Rule 2010; Coastal Regulation Zone (CRZ) Rules 2011, as amended to date; Forest and wildlife act; Other important environmental laws; environmental tribunal act; archaeological sites and remains of national importance; Conservation of natural resources including mining and forestry acts; MoEFCC guidelines and notifications.		
Reference Books:		Year of publication
1	Eco-City Planning: Policies, Practice and Design, Tai-Chee Wong and Belinda Yuen, Springer.	2011
2.	Christian N Madu; Environmental Planning and Management, Worldscientific.	2007
3	James K. Lein; Integrated Environmental Planning; Blackwell Publishing.	2002
4	Armin Rosencranz, Shyam Divan, and Martha L. Noble; Environmental Law and Policy in India: Cases, Materials and Statutes; By Bombay: Tripathi Private Limited.	1991
5	Westman W.; Ecology, Impact Assessment and Environmental Planning; John Wiley and Sons.	1985

Elective-I I (Semester 1)

AR300111		L-T-P
Ecology and Sustainable Development		3-0-0
		3 credits
Aim: To provide exposure to the issues related to the environment and the concept of sustainable development. Course content: 1. Introduction: Fundamental concepts of Ecology, ecological terms and their significance. Biodiversity and human settlement: Ecological pyramids, energy flows and productivity in eco-system, bio-geo-chemical cycles, bio-magnification; Species and inter-species interactions; Biodiversity and ecological equilibrium. 2. Ecology and habitation: Ecological cybernetics, Ecology and their relevance to planning; Human settlement and manmade ecosystems, alternative development approaches, guiding environmental principles, technologies and values, civilizations and impact on environment; contemporary environmental discourse; Green and brown agenda; Global environmental movement, Environment and poverty; Environmental management and environmental planning; global warming, climate change, Bruntland Commission's Report, Agenda 21, Club of Rome Report, UNEP Charters. 3. Climatology: Climatology as a component of manmade ecosystem, macro-, meso- and microclimate; Ecosystem-atmosphere interactions; Urban heat island; Urban wind pattern, aerosols and air pollutants, simulation tools. 4. Resource conservation: Classification and characteristics of environmental resources – energy, water, land, air. Resource assessment: land, water, air and noise and bio-diversity. Land and land use: analysis of problems of availability of resources. Planning imperatives, guidelines and norms for conservation, key issues and recent trends. Case studies. 5. Sustainable Development: International agreements agendas and protocols; UN/International conferences/conventions (global/national issues) Earth Summit at Rio, 1992 and subsequent developments, Agenda 21; UNFCCC; Copenhagen Accord; Montreal Protocol; Kyoto protocol-CDM; Case studies in India under CDM; COPs / United Nations Climate Change Conferences; Environmental concerns of human settlements, Sustainable Development; Concept and elements of sustainable development; Carrying capacity concept and indicators of carrying capacity demonstrated examples; Ecological footprint concept, carbon footprint and sustainability, measures for footprint reduction, learning to use online calculators; Components, structure and meaning of the urban and regional environment;		
Reference Books:		Year of publication
1	Odum, E.P., Barrett, G.W., Brewer, R.; Fundamentals of Ecology; Thomson Brooks, 5 th Edition.	2005
2	Gadgil, M. and Guha; Ecology and Equity - The Use and Abuse of Nature in Contemporary India; Psychology Press.	1995
3	Sunderlal Bahuguna, Vandana Shiva, M. N. Buch; Environment Crisis and Sustainable Development, Natraj Publishers.	1992
4	Our Common Future: The World Commission on Environment and Development; Oxford University Press.	1987

Elective-II (Semester 1)

AR300118 Smart Sustainable Cities		L-T-P 3-0-0 3 credits
Aim: The aim of this course is to familiarize students with the concept of smart and sustainable urban development and develop skills to understand emerging aspects of smart cities practices. Evolution of Smart Sustainable cities: Sustainable cities, eco-cities, green cities, digital cities, intelligent cities, future cities, global cities and smart cities; Smart City in USA, Europe and Gulf countries; application of the main themes of smart cities globally. Introduction to the concept of Smart Sustainable Cities: main dimensions of smart sustainable cities – Information and Communications Technology (ICT); Environmental Sustainability; Productivity; Quality of Life dimension; Equity and Social Inclusion; and Physical Infrastructure. subdimensions, and indicators associated with each dimension. Smart Sustainable cities and key enabling technologies: Urban systems and the role of big data; Role of Information and Communication Technologies (ICTs) in planning smart sustainable cities - supporting cities when planning, operating, and managing urban systems; Smart Energy, smart buildings, smart transport, other related aspects for smart, inclusive and sustainable cities; telecommunication infrastructure, Artificial Intelligence (AI) and smart grids and meters, Examples of smart sustainable cities: Singapore, Copenhagen, Sao Paulo, Holon (Dubai). Smart Cities and future of urban development in India: Development of Smart cities in India, budgetary allowances, urban reforms and capacity building. e-Governance: Meaning and form of e-Governance at national and international experiences in rural and urban areas – organization change and staffing, technology and law related to e-Governance – Municipal websites and e-Governance systems, e-service and e-participation, e-Readiness of local government, e-business versus e-Governance – role of internet and mobile technology in e-Governance, e-Governance for smart cities in India and abroad.		
Reference Books:		Year of publication
1	Rob Roggema, Anouk Roggema; Smart and Sustainable Cities and Buildings; Springer	2020
2	Manuel Pedro Rodríguez-Bolívar; Transforming City Governments for Successful Smart Cities; Springer.	2015
3	Mark Deakin; Husam Al Waer; From Intelligent to Smart Cities; Routledge.	2012
4	Andy Gouldson, Niall Kerr, Corrado Topi, Ellie Dawkins, Johan Kuylensstierna, Richard Pearce; The Economics of Low Carbon Cities: A Mini-Stern Review for the Leeds City Region; The Centre for Low Carbon Futures, University of Leeds.	2012
5	Cities and Climate Change, OECD Publishing	2010
6	Jenks Mike, Joan Colin, “Dimensions of the Sustainable City”, Springerlink.	2010
7	Mary K. Theodore, Louis Theodore; Introduction to Environmental Management; CRC Press.	2009
8	Stephen M. Wheeler, Timothy Beatley; The Sustainable Urban Development Reader; Routledge.	2009
9	Kulkarni V. and Ramachandra T. V.; Environmental Management; TERI Press, New Delhi.	2006
10	Global Green Standards: ISO 14000 and Sustainable Development; International Institute for Sustainable Development.	1996

AR300216		L-T-P
Advanced Landscape Design		3-0-0
		3 credits
Aim: To impart knowledge on advanced concepts of landscape design ranging from local to regional scales. Course content: 1. Introduction to landscape Architecture- Types of landscapes and their characteristics; linkages with nature and built environment; theory of Landscape Architecture; landscape profession and practice in relation to architecture and built environment. 2. Landscape Engineering and Site Planning- Ecological Site Planning; understanding of a site and the surroundings; Site planning for efficient drainage; Earthwork- cut and fill processes and site grading; 3. Landscape Construction: Factors in relation to systems, structures and materials for: Circulation (Roads and Parking, paths and plazas); Level Change (Wall, steps and ramps) Planting (Planters, beds, edges and terraces); Water elements (Pools and water bodies); Landscape structures (Trellis, Gazebos, pergolas); Landscape working drawings. 4. Plants and Design- Visual, aesthetic and functional considerations in planting design; role of plant material in environmental improvement; Planting for appearance of form, leaf colour and texture; branching habit and trunk form and their texture; colour of flowers and fruits; Spring, winter summer and autumn variation in appearance; Planting for various environments such as woodlands, forests, rural areas, urban areas, roadside, etc; 5. Landscape conservation: Natural landscape conservation (Soil, water, biodiversity); cultural Landscape conservation; Watershed management; ecological conservation; landscape restoration and wasteland reclamation. 6. Urban and regional landscapes: Threats to urban landscape resources; urban environmental issues such as solid waste management, air quality, conservation of water resources and vegetation cover; the urban forest: It's ecological social and environmental dimensions. Ways of studying urban vegetation. Its role in the urban landscape; Developmental and Environmental issues associated with particular landscape regions: mountain and hill areas; deserts and wastelands; river and aquatic systems, coastal and estuarine regions. 7. Landscape design schemes for various building types- Analysis and proposals related to Landscape of; Institutional Campuses; Urban civic spaces at urban design scale; Transportation and interchange systems and complexes; Eco-Tourism projects; green rating in landscape project (GRIHA, LEED)		
Reference Books:		Year of publication
1	Steven S; Site engineering for landscape Architects; John Wiley and sons Inc.	2004
2	Reid, G.W., Landscape Graphics; Watson-Guption.	2002
3	Russ, T.H.; Site Planning and Design Handbook; Mc Graw-Hill Companies.	2002
4	Barlow R.E.; A Cultural and Architectural History; Harry N. Abrams.	2001
5	Hunt, J.D.; Greater Perfections: The Practice of Garden Theory; Thames & Hudson.	2000
6	Kaplan, R., Kaplan, S. and Ryan, R.; With People in Mind: Design and Management of Everyday Nature; <i>Island Press</i> .	1998
7	C.W. Harris and N.T. Dines; Time-Saver Standards for Landscape Architecture; McGraw-Hill.	1998
8	Wood, M.L.; Landscape Detailing Volume I –IV; Architectural Press.	1993
9	T.K. Bose, B. Chowdhury; Tropical Garden Plants in Colour: A Guide to Tropical Ornamental Plants For Garden; South Asia Books	1992
10	Ingels, J.E.; Landscaping – Principles & Practices; Pelmer Publishers Inc.	1992
11	Simonds, J.O.; Landscape architecture-A manual of site planning and design; Willey.	1990
12	Mc Harg Ian, "Design with nature", Willey.	1969

1 3	Kevin Lynch; Site Planning; MIT Press, Cambridge, MA	1967
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Elective-I I (Semester 1)

Elective-III (Semester 1)

AR300116		L-T-P
Infrastructure Planning		3-0-0
		3 credits
Aim: The intent of the course is to introduce students to basic concepts of physical infrastructure, analyzing the requirements of various infrastructures for a settlement and impart knowledge of policies, programme and projects for infrastructure for urban and regional infrastructure. Course content: Fundamentals of Infrastructure Planning: Urban physical infrastructure; Planning strategies; Maintenance and management of physical infrastructure. Water supply and distribution systems: Planning principles for water supply and distribution systems; Hydrological systems; Various sources of water; Quality and quantity requirements; Water demand prediction Collection of water; Pumping and storage; Water distribution systems and planning; Design of water supply network; Water treatment plant. Sanitation and Drainage: General considerations and principle of sanitation and sewerage systems; Sewage disposal and treatment methods; Characteristics of waste water, industrial pollutants and their affects; Different methods of sewage treatments, planning and location of treatment plants; disposal of municipal and industrial effluents; effects on rivers and water bodies. Open defecation; Manual scavenging; Innovative approaches of sewage disposal in urban areas and low-cost appropriate technologies for sanitation; Storm water Management. Solid Waste Management: Elements of Solid Waste Management, Classification and Characteristics of Solid Wastes; Solid Waste Collection, Solid Waste Processing; Recycling; Sanitary Landfills. Electric Power Network: Electric Power Network; Planning for urban electrical distribution systems; Location criteria for power station; Implication on land use and density. Policies, Programmes and Projects: Understanding prevalent policies, programmes and projects/missions, for example, JnNURM, AMRUT, HRIDAY, Smart Cities Mission, etc. Course Outcomes: Students will be able to explain basic concepts about physical infrastructure, analyze the requirements of various infrastructures for a settlement for present and future and evaluate the role played by policies, programme and projects for urban and regional infrastructure.		
Reference Books:		Year of publication
1	Virendra Proag; Infrastructure Planning and Management: An Integrated Approach; Springer Nature.	2020
2	Edward Ochieng; Routledge Handbook of Planning and Management of Global Strategic Infrastructure Projects; Routledge	2020
3	Howard S. Peavy, Environmental Engineering, Tata McGrawhill	2016
4	Sasikumar K, Krishana Gopi Sanoop; Solid Waste Management, Phi Learning.	2013
5	C. S. Morgan; Regulation and the management of public utilities; Gale, Making of Modern Law.	2010
6	S. K. Garg; Environmental Engineering (Vol. I): Water Supply Engineering; Khanna Publishers	2010
7	S.K. Garg; Environmental Engineering (Vol. II): Sewage Disposal and Air Pollution Engineering	2010
8	Alvin Goodman, Makarand Hastak; Infrastructure Planning Handbook; McGraw-Hill Education.	2006
9	Jerry A. Nathanson; Basic Environmental Technology; Prentice-Hall of India Pvt. Ltd.	2002
10	Manual on Sewerage and Sewage Treatment, CPHEEO.	1993
11	Steel, E.W.; Water Supply and Sewerage; 6 th edition, McGraw-Hill, New York	1991

Elective-III (Semester 1)

AR300119 Spatial Data Infrastructure	L-T-P 3-0-0 3 credits
Aim: To impart knowledge on advanced concepts of landscape design ranging from local to regional scales. Course content: 1. Concepts and Hierarchy Spatial Data Infrastructure: Concepts, Contents, Nature and SDI hierarchy; Global, National, Regional and Local SDI initiatives; Building a SDI and using it in planning and decision making process; Open Geospatial Consortium- ISO standards (TC211); Data streaming and mining in Spatial Data Infrastructure, OGC Smart Cities Spatial Information Framework 2. Global, National and Local SDI applications Global and National SDI Initiatives: Natural Resources Data Management System (NRDMS): Multi-level spatial data infrastructure, National Spatial Data Infrastructure (NSDI): Assimilation and Dissemination and Data warehouse; State SDI: National Capital Territory of Delhi (NCT Delhi), SDI, Karnataka and Kerala Portals; Case studies from various levels. Karnataka's Land Management Programme: Bhoomi, geo portal assisting local to state level planning process; Gujarat's Tax programme, etc.; Application to coastal area planning - Tamil Nadu coast. 3. SDI application in Planning and Decision Support SDI: Location based technology development, Interoperability arrangement for geospatial data and ontology mapping; Application in Bhuvan and its spatial applications, Population Data Sets, Natural Resource Repository, Integrated Water Resource Management, mKrishi – application in agriculture and rural development, geospatial application in transportation, disaster management and conservation; Spatio-temporal data modeling and analysis; 3-D (Dimensional) mapping of land and its use in city and regional planning, Geo visualization of landscapes, spatial inequalities. Participatory Geographical Information Systems (PGIS): Definition, concept and need; PGIS and Public Participation Geographic Information System (PPGIS); Geo-referencing and visualizing indigenous spatial knowledge; Ethical issues in PGIS; PGIS for regional level technology-based information system; case studies and application of PGIS in India. 4. Real time technologies SDI and decision support system and their applications: landslides monitoring in Himalayan region, web based spatio-temporal prediction of landslides, decentralization planning in Uttarakhand - web based model. Satellite based and other real time technologies and their use in identifying physical transformation and its application in flash flood warning system in river and coastal belt, etc. 5. Spatial Data extraction techniques from Bhuvan Portal, usgs earth explorer, Diva GIS, GADM, Natural Earth Data, Geofabrik, Open Street Map data, Gis-Lab info, MapCruzin, Sedac data, etc.	
Reference Books:	Year of publication
1 Ian P. Williamson , Abbas Rajabifard , Mary-Ellen F. Feeney ; Developing Spatial Data Infrastructures from Concept to Reality; CRC Press.	2018
2 Ezra Dessers; Spatial Data Infrastructures at Work- Analysing the Spatial Enablement of Public Sector Processes; Leuven University Press.	2013
3 Nogueras-Iso, Javier, Zarazaga-Soria, Francisco Javier, Muro-Medrano, Pedro R.; Geographic Information Metadata for Spatial Data Infrastructures; Springer-Verlag Berlin Heidelberg.	2005
4 Javier Nogueras-Iso, Javier Nogueras-Iso F. Javier Zarazaga-Soria Pedro R. Muro-Medrano, Pedro R. Muro-Medrano, Francisco Javier Zarazaga-Soria; Geographic Information Metadata for Spatial Data Infrastructures-Resources, Interoperability and Information Retrieval; Springer.	2005
5 Yannis Manalopoulos, Apostolos Papadopoulos , Michael Gr. Vassilakopoulos; Spatial Databases: Technologies, Techniques and Trends; IGI Global.	2004
6 Richard Groot and John Douglas McLaughlin; Geospatial Data Infrastructure Concepts, Cases and Good Practice; Oxford University Press .	2000

Elective-I (Semester 1)

AR300114		L-T-P
City and Metropolitan Planning		3-0-0
		3 credits
Aim: To create awareness about urban growth, systems, linkages between city and region, problems and issues of metro and mega cities and planning for the metropolitan areas. 1. Concept and approaches to metropolitan planning; Theorizing the city – Chicago school, Postmodern school, Post structuralist school, Critical urban theory. 2. Changing urbanity between a city and a metropolis. Anatomy, growth and trends of metropolitan development, Delineation techniques of metropolitan areas; Primate city and its characteristics, Metro and mega-cities – issues, processes and trends. 3. Urban sprawl: Urban sprawl and suburbanisation; Core-periphery; Transit-oriented development; Global city and city regions; urban and rural transformation; urban-rural continuum; urban sprawl projections. 4. Components of a metropolitan plan: economics, transportation, etc. in evolving metropolitan framework. Multi-nuclei developments: hierarchy of urban centres and their functional linkages. 5. Urban economy: Urban economies; City as growth engine; Economic restructuring; The post 1973 World; Neo-liberal cities; Gentrification and the Revanchist City; Public space and right to the city. 6. Governance: Collaborative governance in cities; Patterns and policies of urban developments; Decentralisation and Metropolitan Planning Committees; decentralization as alternative to metropolitan growth, their merits and demerits. 7. The interdisciplinary policy issues and public action for guiding metropolitan development, including inter-governmental relations and national urban policy; Case studies of metropolitan planning in India and abroad. Indian policies (73rd and 74th Constitutional Amendments) and programs related to metropolitan planning; inter-sectorality.		
Reference Books:		Year of publication
1	Derek Senior ; The Regional City: An Anglo-American Discussion of Metropolitan Planning; Routledge.	2017
2	Derek Senior; The Regional City: An Anglo-American Discussion of Metropolitan Planning; Routledge.	2017
3	S.K. Aggarwal, V. Nath; Urbanisation, Urban development & Metropolitan Cities in India, Concept Publishing Company, New Delhi	2007
4	Chaudary J.R, An Introduction to Development and Regional Planning: With Special Reference to India	2009
5	Yadav. V, Metropolitan Governance cases of Ahmedabad and Hyderabad, Copal Publishing Group, Ghaziabad.	2014
6	Neil Brenner, Peter Marcuse, Margit Mayer; Cities for People, Not for Profit: Critical Urban Theory and the Right to the City; Routledge.	2012
7	Brooks.N, et al, The oxford handbook of Urban Economics and Planning, Oxford press, New York.	2012
8	Neil Brenner , Peter Marcuse , Margit Mayer ; Cities for People, Not for Profit: Critical Urban Theory and the Right to the City; Routledge.	2012
9	Robert Bruegmann ; Sprawl: A Compact History; Chicago University Press.	2005
10	Robert Bruegmann; Sprawl: A Compact History; Chicago University Press.	2005
11	Willem G. M. Salet, W. G. M. Salet, Andy Thornley, Anton Kreukels; Metropolitan Governance and Spatial Planning: Comparative Case Studies of European City-regions Taylor & Francis.	2003
12	Willem G. M. Salet, W. G. M. Salet, Andy Thornley, Anton Kreukels; Metropolitan Governance and Spatial Planning: Comparative Case Studies of European City-regions Taylor & Francis.	2003
13	Arthur Gallion, Simon Eisner; The Urban Pattern: City Planning and Design, Van Nostrand Reinhold.	1986

1	Patrick Geddes Sir; Cities in Evolution: An Introduction to the Town Planning	1915
4	Movement and to the Study of Civics; Williams & Norgate.	

Elective-I (Semester 1)

AR300115 <i>Advanced Housing and Community Planning</i>	L- T- P 3-0 -0 3 cre dit s
Aim: To understand housing scenario in India and to assess the community level issues related to housing. Course content: 1. Concepts and Definitions a) Shelter as a basic requirement, determinants of housing form, Census of India definitions, Introduction to policies, housing need, demand and supply, dilapidation, structural conditions, materials of constructions, housing age, occupancy rate, crowding, housing shortage, income and affordability, poverty and slums, houseless population b) Various housing typologies viz. traditional houses, plotted development, group housing, multi-storied housing, villas, chawls, etc., slums and squatters, night shelters, public health issues related to housing, various theories of housing, concept of green housing, green rating of housing projects. 2. Social and Economic Dimensions a) Housing as social security, role of housing in development of family and community well-being, status and prestige related to housing, safety, crime and insecurity, deprivation and social vulnerability, ghettoism, gender issues, housing and the elderly b) Contribution of housing to micro and macro economy, contribution to national wealth and GDP, housing taxation, national budgets, fiscal concessions, forward and backward linkages. for institutions and housing development, approaches and contents of National Housing Policy. Housing norms, design and standards, units of housing design, layouts, densities and neighborhood units; infrastructure and community facilities, form and structure of housing as shaped by socio-economic and physical parameters. 3. Housing and the City a) Understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions, a) Suitability of land for housing, housing stress identification, projecting housing requirements, calculating housing shortages, housing allocation. 4. Planning for Neighbourhoods a) Approaches to neighbourhood living in traditional and contemporary societies, elements of neighbourhood structure, Planning and design criteria for modern neighbourhoods, norms and criteria for area distribution, housing and area planning standards, net residential density and gross residential density, development controls and building byelaws, UDPFI guidelines, NBC 2005 provisions. b) Case studies of neighbourhood planning 5. Affordable Housing: Housing for the low-income groups – slums and squatter settlements, investment in housing in public and private sectors; Cooperative housing, objectives and principles, management and financing of housing projects; Acts, policies and programmes; Comparative policy analysis.	
Reference Books:	Year of publication

1	Jain A K; Housing and Community Planning: Design, Construction and Infrastructure; Discovery Publishing House Pvt Ltd.	2016
2	Guidelines on Social Housing Principles and Example; UNECE Information Service.	2006
3	Edwards, Brian; Sustainable housing: Principles and Practice; Taylor & Francis.	2000
4	Bawa R. L., Fernandes B. G.; Design for Living: A Guide for Planning of Residential Neighbourhoods; Galgotia Publishing Company; N. Delhi	2000
5	Mathur, G C.; Low Cost housing in development countries; South Asia Books.	1993

Elective-IV (Semester 2)

AR300216		L-T-P
Advanced Professional Practice		3-0-0
		3 credits
Aim: The aim of this course is to enable the students to understand the implications of the plans that they will be making as well as the professional practice guidelines. Course content: 1. Introduction: Type of offices for architectural and planning practices, Role of professional/ Planner/Architect/Technical Person, Scope of work, Staff structure, Filing records, Correspondence and drawings, Presentation in drawings, Recording minutes of meetings, agenda, board meetings, circulars, office order, NBC-2016 Volume 1 and 2, fire safety measures of the buildings, Local Building Byelaws, Zoning Regulation; residential, institutional, industrial agricultural entertainment etc., Introduction to city, town and village level regulatory mechanism, code of practice, Standard Operating Procedure, and Manuals. Evolution of town planning act in India. 2. Institutions and Organisations: Different between organizations and institutions, government and governance; Organisations: types, concepts, theories, structure and functions; approaches to understanding organizations; Institutional building: factors and processes, institution Process and networks-how the network operates. 3. Codes of Conduct: Basic Ethics, detail understanding of Professional Ethics, and Professional Misconduct / Disputes. Professional Practice under International Agreements (GATT & WTO) and its impact in India. Indians Architects act 1972, Professional Code of Conduct 1989, URDPFI Guideline, RADPFI Guideline, Copyright Act, Arbitration Act etc. Various professional associations and registering body such as COA, IIA, ITPI; their role and responsibilities. 4. Consultancy Services: Types of consultancy services in Urban and Regional (including rural and environment) Planning, Transport and Mobility Planning (Railways, Highway Metros, , Expressway etc.), Social and Physical Infrastructure services, Spatial Planning Policies/Guidelines, Architectural and Urban Conservation, EIA, India's Green Building Rating Systems (LEED, IGBC, GRIHA) services etc. Formulation of consultancy project proposal and outlines, Expression of Interest (EoI). Bids and Request for Proposal in architecture and planning services: Bidding Process, Schedule of Bidding Process, Preparation and Submission of Bids, Contents of the RFP. Purpose of DPR, project description, existing site conditions, objective of the development, guiding principles etc. Role of Inter-Disciplinary groups: appreciation of decision-making process and the process in relation to varied consultancy assignments in planning and architecture. 5. Scale of Professional Fees and Charges: Methods of Professional Fees Calculation, Scale of Professional Fees, Minimum Person-Months, Method of Fee Calculation on Person-Month Basis for all Professional Services, Cost of Surveys, Increase in Fees for Inflation, Schedule of Payment of Fees. 6. Appraisal, monitoring, and evaluation of the project: Technical Appraisal, Financial Appraisal, Economic Appraisal, Social Appraisal, Commercial Aspects of Appraisal, Environmental Appraisal, Institutional Appraisal, Risk and Uncertainty. Monitoring a project: Techniques and software for project monitoring. Evaluation: Types of evaluation and its effectiveness. Problem Solving: Cost effective, cost-benefit analysis, discounted cash flow techniques, calculation of Internal Rate of Return (IRR) and Economic Rate of Return (ERR).		
Reference Books:		Year of publication
1	Apte, V. S.; Architectural Practice and Procedure; Pune: Padmaja Bhide.	2008
2	Chappell, D. M. And Willis; A. The architect in practice; 9th Ed. Oxford: Blackwell Publications.	2005
3	Handbook of Professional Documents; Council of Architecture.	2005
4	Charles, E.; TQM and ISO 9000 for architects and designers; New York: McGraw-Hill.	1996
5	Architects (Professional conduct) Regulations, Architectural Competition guidelines; Council of Architecture Publications.	1989

6	Shajahan, S.; Organisational Behaviour; New Age International (P) Ltd Publishers	2015
7	Kundan Singh, Mitthan Lal Kansal; Project Planning And Management With CPM And PERT	2021
8	ITPI; Code of Professional Conduct	2019
9	ITPI; Condition of Engagement of Professional Services and Scale of Professional Fees and Charges	2019

Elective-IV (Semester 2)

AR300122		L-T-P 3-0-0 3 credits
Planning Legislation and Governance		
Aim: The aim of this course is to introduce the students to the Acts and laws related to planning and governance, institutional set-up and their functioning. 1. Introduction to Planning Legislation - Concepts of law, Sources of law (i.e. custom, legislation and precedent), the meaning of terms of law, legislation, ordinance, bill, act, regulation and Byelaws - Benefits of statutory backing for schemes-eminant domain - Evolution of Planning Legislation. An overview of legal tools connected with urban planning and development. Town and Country Planning Act. Improvement Trust Act. Urban Planning and Development Authorities Act. Objectives, contents, procedures for preparation and implementation of regional Plans, Master Plans and Town planning Schemes - Contemporary legislation and institutional framework - Concepts of Arbitration, betterment levy, development charges and public participation in the statutory planning process. Concept of structure plan, local plan and action plan under the English Law 2. Planning laws, regulations and acts - Town and Country Planning Acts - Municipal Acts - Concept of CRZ, SEZ and its application - Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 – basic concept, the procedure for compulsory acquisition of property and determination of compensation 73rd and 74th Constitutional Amendment Act - Rent control Act - The Real Estate (Regulation and Development) Act, 2016 - Building Byelaws, development controls and zoning regulations - Environmental acts 3. Municipal Governance and Public Participation: History, evolution of centralized versus decentralized governments, Government reforms – Lessons from JNNURM, Demography and participating democracy, citizen participation and participatory governance – organization, types, structure, function, communication and organizational climate – Information communication system and local government – role of people in local government decision making process. Network Governance and multi-stakeholders Governance.		
Reference Books:		Year of publication
1	Congleton, R.D., 2007. Understanding institutional diversity. Cambridge: Cambridge University Press.	2007
2	Aoki, M., Jackson, G. and Miyajima, H., 2007. Corporate governance in Japan: Institutional change and organizational diversity. New York: Oxford University Press.	2007
3	What is Good Governance, New York: UNDP.	2003
4	Urban Governance: A sourcebook on indicators, New York: UNDP.	2002
5	United Nations Centre for Human Settlement. Urban Indicators Tool kit guide, New York: Oxford University Press.	2000
6	Merino R. and Pinto, 2000. Metropolitan City Governance in India, New Delhi: Sage Publications.	2000
7	Mathur, O. P., 1999. India: The Challenge of Urban Governance, NIPFP & Centre for Urban & Community Studies.	1999
8	United Nations Centre for Human Settlement (HABITAT), 1996. An Urbanising World: Global Report on Human Settlements. New York: Oxford University Press.	1996
9	Bewa and Kumar, V., 1987. Indian Metropolis urbanization, Planning and Management, New Delhi: Inter India Publications.	1987

Elective-IV (Semester 2)

AR300223		L-T-P
Urban and Regional Governance		3-0-0
		3 credits
Aim: To develop understanding of governance systems of cities and regions with a focus on land and built environment. Course content: Evolution of Urban and Regional Governance: Introduction to governance; History of governance of urban and regional after 1947; Organizations involved in planning; Development and Management of urban and rural areas; Present status of urban and regional governance in India. Devolution of Local Self Government: Need for decentralization and devolution of powers from state governments to local government; District Planning Committees and Metropolitan Planning Committees; Current position of implementation of 73rd and 74th amendment acts. Role of the other agencies: Shift from government to governance; Context of governance for greater involvement of the private sector; Ideas of good governance; Public private partnerships; Role of global players such as the World Bank, IMF, Asian Development Bank, the private sector, INGOs, NGOs, CBOs. Land Administration and Management: Models of land assembly in India - Bulk land acquisition, land reconstitution, etc.; Land administration and management; Understanding maps of land records; Methods of keeping land records in urban and rural areas. Course Outcomes: Students will be able to explain governance system of cities and region with particular focus on land and built environment.		
Reference Books:		Year of publication
1	Erwin Hepperle, Robert Dixon-Gough, Reinfried Mansberger; Challenges for Governance Structures in Urban and Regional Governance; vdf Hochschulverlag	2015
2	Sivaramakrishnan, K.; Revisiting the 74th Constitutional Amendment for better Metropolitan Governance, <i>Economic and Political Weekly</i> , Vol. 31, No. 13, pp. 86-94.	2013
3	P. N. S. Rao; Urban Governance and Management; Indian Institute of Public Administration; Kanishka Publishers	2006
4	Sivaramakrishnan, K. C., and Maiti, A. (2009) Metropolitan Governance in India, An Overview of Selected Cities, East West Center, Honolulu.	2009
5	What is Good Governance, New York: UNDP.	2003
6	Urban Governance: A sourcebook on indicators, New York: UNDP.	2002
7	Freire, M. and Stren, R.; The Challenges of Urban Government: Policies and Practices, World Bank, Washington, D.C.	2001
8	Urban and Regional Governance in the Asia Pacific; Pacific Educational Press.	1999

AR300224		L-T-P
Development Management and Finance		3-0-0
		3 credits
Aim: To create awareness about systems of implementing development plans and policies through planning and development projects, funding of projects, and about the concepts of development finance, revenue and municipal finance. Course content: Overview of Development: Finance Understanding development finance: approaches, concepts, credit ratings; Role of municipalities and panchayats, development authorities, infrastructure and industrial development corporations, special economic zones and special purpose vehicles. State and Municipal Finance: Central Finance Commission and state finance commissions: constitution, powers and functions; consolidated fund of central and state; Financing municipalities and panchayats and financial categorisation of sources of revenue; Reforms in municipal and panchayat finances, rationalisation of user charges, and streamlining of tax administration. Public Private Partnership (PPP): Partnerships and alliances: concepts, need, preconditions for partnerships; Advantages of collaboration; Methods of promoting public private partnerships; Policies, statutes, regulations and administrative procedures for forging partnerships; Role of government as partner, regulator and enforcer of laws; Principles of PPP: contractual framework, selection of service provider, payment mechanism, monitoring and evaluation, risk and revenue sharing; and Models contract agreement. Innovative Methods for Financing Urban Development: Monetary Exaction: betterment levy, impact fees, external development charges and vacant land development tax; Land exactions: Transfer of development rights, town planning schemes, monetisation of underutilised public assets; Valorisation charges; Debt financing, partnership financing, financing through intermediaries, Municipal bonds, and pooled financing; Funding of development plan proposals and projects. Course Outcomes: Students will be able to express understanding about the major aspects of development finance including municipal finance; and to develop specialized knowledge and relevant skills in urban finance. To demonstrate understanding about the financial challenges being faced by urban local bodies. To propose effective financial management systems with enhanced organizational capacity for urban reforms.		
Reference Books:		Year of publication
1	Fisher, R.C.; State and Local Public Finance, Routledge, New York.	2018
2	Nicholas Biekpe, Danny Cassimon, Andrew William Mullineux; Development Management and Finance; Springer.	2017
3	Mohanty, P.K.; Financing Cities in India: Municipal Reforms, Fiscal Accountability and Urban Infrastructure , Sage, New Delhi.	2016
4	Justice Nyigmah Bawole, Farhad Hossain, Asad K. Ghalib, Christopher J. Rees, Aminu Mamman; Development Management: Theory and Practice; Taylor & Francis.	2016
5	Roy W. Bahl, Johannes F. Linn; Urban Public Finance in Developing Countries; Oxford University Press.	1992
6	Pearle M. Kamer; Crisis in Urban Public Finance; Greenwood.	1983
7	P. N. S. Rao; Urban Governance and Management; Indian Institute of Public Administration; Kanishka Publishers	2006
8	What is Good Governance, New York: UNDP.	2003
9	Bell, C.; Development Policy as Public Finance, Oxford University Press, Oxford.	2003
10	Kaushik, B.; Analytical Development Economics: The Less Developed Economy Revisited, MIT Press, Cambridge, MA.	2003
11	Urban Governance: A sourcebook on indicators, New York: UNDP.	2002
12	Freire, M. and Stren, R.; The Challenges of Urban Government: Policies and Practices, World Bank, Washington, D.C.	2001

1 3	Bhattacharya, M.; Management of Urban Govt. of India; Uppal Book Store, New Delhi	2000
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Elective-IV (Semester 2)

Elective-IV (Semester 2)

AR300218		L-T-P 3-0-0 3 credits
Advanced Urban Design		
Aim: The aim of this course is to develop concepts of urban design at various urban scales to enable engaging in an effective design process that entails holistic approach and equip them with appropriate relevant urban design techniques and tools. Course Contents: 1. Introduction of Urban Design and Cities, Early examples of Urban Design in classical and pre-industrial cities – Heritage and the roots of our modern concepts in urban design (a comparative study of Western and Indian Urbanism through different case studies). 2. Objectives and scope of urban design, Basic functions, principles and techniques. Modern Techniques, Methods and Emerging Approaches to Urban Design; Behavioural Issues in Urban Design; Principles of Urban Spatial Organization. 3. Urban Design and Urban Analysis through Surveys in Urban Areas, Scale in Urban design - Understanding Scale and Issues of Urban Design Interventions and Strategies in Cities, urban mass, perceiving and mapping a city, Urban Space. Urban activity and circulation. Examples at regional, metropolitan, Urban and project level. 4. Urban Spaces - Hierarchy and Nature, Sense of Enclosure, Isolation and Continuity, Skin and Perception; Urban Massing in Built Form; effect of light, sense of enclosure, detail design aspects; 5. Imageability and Elements of Urban Design according to Kevin Lynch; The Social, Perceptual, Temporal and Morphological Aspects of Urban Design; Road forms and Townscape; Urban design survey technique and its application; Modern techniques and emerging approaches to urban design; 6. Techniques of Urban Design with emphasis on public policies, conservation and economic considerations, Road forms, serial, grid-iron, Hierarchy of access routes - Pedestrian areas and malls and Urban elements. Urban Design at Micro Level: Campus Planning, City Centres, Transportation Corridors, and Residential Neighbourhoods, Designing urban waterfront. 7. Legal aspects with respect to Land Acquisition Act and Town Planning acts - financing for Project realization – Agencies involved in the execution – coordinating role of planning authorities. Development Control Guidelines, Zoning - Restrictive, Indicative, Performance and Incentive Zoning. Urban Arts Commission. Planning and Design parameters for New sustainable Urban spaces. 8. Case Studies of Urban Design and Urban renewal Projects: Best Practices and Analysis of Urban Design Projects in India.		
Reference Books:		Year of publication
1	Fransesc Zamora; Source of Contemporary Urban Design, Harper Collins Publisher.	2012
2	Alex Krieger, William S. Saunders; Urban Design; University of Minnesota Press.	2008
3	Michael Larice · Elizabeth Macdonald; The Urban Design Reader, Routledge, New York.	2006
4	Stephen Marshall, Streets and Patterns, Routledge.	2004
5	Donald Watson, Alan J. Plattus, Robert G. Shibley; Time-saver standards for urban design, McGrawHill.	2003
6	Mathew Carmona, Steve Teisdell, Public Places Urban Spaces: Dimensions of Urban Design, Architectural Press, London.	2003
7	Jonathan Barnett, Redesigning Cities: Principles, Practice, Implementation; APA Planners Press.	2003
8	Sunil Khilnani; The Idea of India; Farrar, Straus and Giroux.	1999
9	Cliff Moughtin, Rafael Cuesta, Christine Sarris, Paola Signoretta; Urban Design: Method and Techniques; Architectural Press	1999
10	Spiro Kostof; The City Shaped; Bulfinch.	1991
11	Arthur Gallion, Simon Eisner; The Urban Pattern: City Planning and Design, Van Nostrand Reinhold.	1986

1 2	Christopher W. Alexander, Sara Ishikawa, Murray Silverstein, Max Jacobson, Ingrid Fiksdahl-King, Shlomo Angel; A Pattern Language: Towns, Buildings, Construction; Oxford University Press	1977
1 3	Cullen, G., Townscape, London Architectural Press	1968
1 4	Edmund Bacon Design of Cities; Harmony (Aesthetics) Publisher New York.	1967
1 5	Paul D Spreiregen; Urban design: the architecture of towns and cities. American Institute of Architects.	1965
1 6	Kevin Lynch; The Image of the City; MIT Press.	1960

Elective-V (Semester 2)

AR300113		L-T-P
<i>Settlement System Planning</i>		3-0-0
		3 credits
Aim: To create awareness about the concepts of settlement system planning. Course content: 1. Structure, morphology and functional classification of Indian cities. Elements of settlement system size, function, spacing, linkage, input tributary and output tributary, settlement patterns and factor responsible thereof. 2. Measurement of distribution of settlements, size and class of settlements, cluster and agglomeration studies, functional attributes and spacing of settlement, potentialities and centrality of settlements. 3. Growth, density and spatial inequalities of population distribution, spatial pattern and characteristics of occupational types, Ekistics- A science of human settlements 4. Industrialization vs. urbanization, modernization of countryside, regional variation in industrialized urbanization. Socio-economic aspect of population growth and distribution. factors of migration, types and patterns, urban rural migration and impact on developments 5. Distribution of city size and rank-size rule, negative exponential density gradient. Theoretical framework of central place theory. Christaller's fixed K-hierarchy, Losch's general system of location of settlements, variable K-hierarchy, loschien economic landscape. 6. Interaction among settlements and cities as system within systems of cities. Urban models and structure changes-Forrester's urban dynamics. 7. New approaches in dynamical system modeling. a. Spatial interaction activities- the Wilson models, application of the models in the retailing and residential subsystems; from deterministic to stochastic approaches to special dynamics, stability of a special growth process, the chaotic analysis and catastrophe theory. b. Paradigm of self-organization, towards a new synthesis in the modeling of evolving complex systems. c. Bifurcation in dynamical system theory, the mathematical ecology of cities-Dendros models.		
Reference Books:		Year of publication
1	Friedman J.; The World is flat: A brief History of 21 st Century, Straus and Giroux publishers, NY.	2005
2	Baker, M., Some reflections on strategic planning processes in three urban regions, Planning Theory and Practice; Taylor and Francis Limited	2001
3	T. Kawashima and P. Korcelli; Human Settlement Systems: Spatial Patterns and Trends; International Institute For Applied Systems Analysis.	1982
4	Faludi A.; Planning Theory; Pregamon Press, Oxford, England, UK	1973

Elective-V (Semester 2)

AR300121		L-T-P
Rural Area Planning and Management		3-0-0
		3 credits
Aim: To understand the basic concepts rural area planning, development and management strategies. Course content: 1. Fundamentals of Rural Planning Concept of Rural regions: Concepts of Rural Area and Rural Development; Scope of Rural Development; Historical Evolution of Rural Development and Rural Settlement Pattern in Indian Context; Economic Issues of Rural Development – Differentiating Economic Growth and Economic Development; Rural Jobs and Income Sources; Rural Economic Policy Village Planning within the wider context of regional development; Rural regional theories and studies; Regional planning process for general and for specific needs. Case studies of development planning of villages and various types of rural regions of India. 2. Rural Development Introduction: Meaning and Scope and overview of rural development: Historical perspective – Rural Development Programmes in India. Problem / perception and identification; Rural Area Planning – Programmes / Policies / Schemes for rural development, their coverage and outcomes; Rural Infrastructure Development: Bharat Nirman – A business plan for rural infrastructure, Rural Building Centres, PMGSY, IAY, Rajiv Gandhi Technology Mission, Central Rural Sanitation Programme, PURA. Rural Employment Schemes: Mahatma Gandhi National Rural Employment Guarantee Act, 2005, Sampoorna Grameen Yojana, National Food for work programme, Swarna Jayanty Gram Swarozgar yojana, National Social Assistance Programme. Programmes: Command Area Programme, Drought Prone Area Programme, Backward Area Development Programme, North Eastern Development Programme. Technology Missions: Water, Sanitation, etc. Institutional framework: Institutions for rural development, community development; DRDA; Local self-governments, district planning office; state planning boards; state rural development institutions; NIRD and SIRD. Case studies. 3: Changing Profile of the Rural areas of India: Consumption pattern changes, land utilization changes, cropping pattern changes, holding size change, living standard changes, changes in asset ownership – its implication in the planning process; Rural Settlement Analysis: Types, activity, environment and economic interface in rural habitat, technology in rural settlement; Land Utilization: Types of land utilization and its relevance to planning; Land conversions and its regulation / facilitation in peri-urban areas; Land utilization analysis; Common property and its use, tenancy and ownership, holding size and its relevance, irrigated and non-irrigated and land values; Sources of information for land information;		
Reference Books:		Year of publication
1	Singh, K. and Reddy, K.; Designing and Managing Rural Development Organisation; New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.	2016
2	UDPFI Guidelines Volume 1, Ministry of Urban Affairs and Employment Govt. of India, New Delhi.	2014
3	S. P. Singh, Planning and Management for Rural Development, Mittal Publisher,	2003
4	Katar Singh, Rural Development, Principles, Policies and Management, , Sage, New Delhi	1999
5	Kumar B Das. Rural Development through Decentralization	1991
6	Thakur, D. and Singh, S.N.; District Planning and Panchayati Raj. Deep and Deep Publications.	1991
7	Yugandhar, B.N. and Mukherjee, A. Readings in Decentralised Planning: With Special Reference to District Planning, Vol. 1. Concept Publishing Company.	1991
8	R Patnayak, Rural Development in India, Vikas Publishers	1990
9	Venkata K. Reddy,. Rural Development in India - Poverty and Development, Himalaya Publishing House , Bombay	1988

Elective-V (Semester 2)

AR300214		L-T-P
Regional Analysis and Programming		3-0-0
		3 credits
Aim: To create awareness about regional planning and techniques involved in regional planning. Course content: 1: Introduction to Regional Planning - Introduction to Regional planning, regional analysis and regional science - Regional development models: their structures and characterization and construction, delineation of regions and regionalization methods and techniques. - Cost benefits analysis, dynamics of project analysis, financial feasibility. - Input-output analysis (regional and inter-regional), input-output models and applications, input-output studies at National and State level in India - Flying Geese Model. 2. Regional Intersection - Regional Intersection: gravity potential and spatial interaction models, application of gravity models in migration estimation and marketing - Measures of regional development, proportionality effect and effect due to inter-regional changes in position (RIP) module, sectoral models of regional development, planning estimation for macro-region. - Inter-regional linkages, general inter-regional equilibrium model, micro aspects of action programming 3. National Planning Techniques - Five-year planning process with reference to urban and regional planning in India. NITI AYOOG. - Estimation, regional social accounting, estimation of regional demands, regional capacities and allocation of products-interregional flow analysis. - Regional cycle and multiplier analysis, Chakravorty-Lefebvre multi-sectoral interregional model. Allocation of investments-interregional and inter-sectoral, regional income.		
Reference Books:		Year of publication
1	Chandna R.C.: Regional Planning and Development: Kalyani Publishers.	2016
2	MoUD.; Regional Planning Approach, URDPFI vol. I and Vol.2.; New Delhi	2014
3	Walter Isard, Iwan J. Azis, Matthew P. Drennan, Ronald E. Miller, Sidney Saltzman, Erik Thorbecke; Methods of Interregional and Regional Analysis; Routledge.	1998
4	Nijkamp, P. and Delft, A. V.; Multi-Criteria Analysis and Regional Decision-Making; Leiden: Martinus Nijhoff Social Sciences Division.	1977
5	Glasson, J., An Introduction to Regional Planning, London: Taylor and Francis Ltd.	1974

Elective-V (Semester 2)

AR300215		L-T-P
Metropolitan Regional Planning		3-0-0
		3 credits
Aim: The of this subject is to provide overview on planning and governance in metropolitan regions from various perspectives. Course content: 1. Concept of metropolitan region: metropolitan structure and suburban hierarchy, agglomeration, conurbation, commuter belt around a city, transit oriented development, polycentric metropolitan region. Delineation of a metropolitan region. Territories with specific geographic features. economic, social and territorial cohesion. 21st-century metropolitan regions. 2. Metropolitan region and problems of major agglomerations: studies in conjunction with Le Corbusier's theories for major cities and Doxiadis theories for Dynapolis and Megalopolis, Transport as a major problem in metropolitan regions, inadequate urban-economic infrastructure and fragmented planning and governance arrangements. 3. Contemporary processes of metropolitan change: Structural changes-counterurbanisation, suburbanization, desurbanization, suburbanization of economic activities of the central city. 4. Approaches to planning of Metropolitan regions: Spatial imaginaries, and planning styles. Planning strategies, schemes, structure plans. Process, report and map preparation. 5. Governing metropolitan regions: Institutional approaches, policy mobilities, institutional overlap and institutional framework. Legal, administration and fiscal aspects of planning for metropolitan regions and problems of implementation. Time-phasing of proposals. policy and decision-making responsibilities. 6. Examples and case studies of India and abroad.		
Reference Books:		Year of publication
1	Willem G. M. Salet, W. G. M. Salet, Andy Thornley, Anton Kreukels; Metropolitan Governance and Spatial Planning: Comparative Case Studies of European City-regions Taylor & Francis.	2003
2	Zimmermann, Karsten, Galland, Daniel, Harrison; Metropolitan Regions, Planning and Governance; Springer.	2020

AR300225		L-T-P
Remote Sensing and GIS in Planning		3-0-0
		3 credits
Aim: To provide knowledge about remote sensing and to create proficiency among students in the use of GIS software(s). Course content 1. Introduction to Geoinformatics: Definition of Geoinformatics, Remote Sensing, Geographical Information System, Spatial Data Infrastructure, Data Base Management System, Need of Geoinformatics in Urban and Regional Planning. 2. Introduction to aerial photography: Introduction to Aerial Photography. Principles of Aerial Photography, Photogrammetry, Qualitative and Quantitative aspects of Aerial Photography; stereovision, Scale, Geometry Relief displacement and parallax displacement. 3. Introduction to Remote Sensing: Concept of Remote Sensing, Satellite Remote sensing, Principles of satellite Remote sensing, Resolutions – Spatial, Temporal, Spectral, Radiometric; Geo-Referencing; Geometric Distortions. a. Raster Data Processing and Analysis: Visual Image Interpretation – Qualitative and Quantitative b. Elements. Remote Sensing Data Products c. Digital Image Processing: Image preprocessing, image Enhancement, Unsupervised Classification, Supervised Classification. 4. Introduction to GIS: What is GIS, Geospatial Technology, Components of GIS, Spatial and Non-Spatial Data Base Coordinate system and geo-coding, Rater and Vector Data Types, Functions of GIS. a. Map projection and Georeferencing: Type of projections, Coordinate System, Datum, UTM Zones b. Spatial Data Creation: Data inputting and Editing- Digitization; Vector Data Features, Map registration, Digitizing errors. Non-Spatial Data – Database Creation; Integration of Spatial and Non-Spatial Data; Data Query. c. Spatial Database Management System: SDBMS: Characteristics, Database Components, Types of Database Structure, Relational Database Management System, Features, Relational Joins Spatial Data Analysis: Data Presentation: Layout Preparation – Grids, Legend, Symbolology. 5 Application of Geoinformatics in Spatial Planning Application of aerial photography in urban studies. Application of RS, GIS and GPS in Urban and Regional Studies - geology, geomorphology, forest and vegetation, water resource and drainage system, land use and land cover analysis, urban sprawl studies etc. 6. Customization and user specific programming in software		
Reference Books:		Year of publication
1	Maarseveen MV., Martinez, J. and Flacke, J. GIS in Sustainable Urban Planning and Management A Global Perspective, CRC Press, Taylor and Francis Group, Newyork.	2019
2	Qihao Weng; Remote Sensing and GIS Integration: Theories, Methods and Applications; McGraw Hill Professional	2009
3	Thomas M. Lillesand, Ralph W. Kiefer, Jonathan Chipman; Remote Sensing and Image Interpretation; John Wiley and Sons Ltd.	2008
4	Maik Netzband; William L. Stefanov; Charles Redman; Applied Remote Sensing in Urban Planning, Governance and Sustainability; Springer.	2007

Elective-VI (Semester 2)

Elective-VI (Semester 2)

AR300117		L-T-P
<i>Integrated Urban Conservation</i>		3-0-0
		3 credits
Aim: To understand historic settlement as heritage, with a focus on the Indian Context and conservation of urban heritage in an integrated manner. Course content: 1. Reading the morphology of a historic settlement and its associated region. 2. Parameters/ Systems that shape historic settlements and their architectural form: the city assembled and the city shaped in Indian context. 3. The discourse on traditional and contemporary urbanism. 4. Historic cities as repositories of knowledge: the Indian context. 5. Historic Urban Landscape Approach: Urban conservation as an interdisciplinary and multidisciplinary process. 6. History of Integrated Urban Conservation approaches in the world with selected examples: York, Chester, Bath, Bologna, Ferrara, Cairo. 7. Approaches to integrated conservation in India with select examples explaining urban conservation tools and methods: Inner city regeneration, adaptive reuse, infill development etc. 8. Institutional framework for urban conservation and renewal strategies in India.		
Reference Books:		Year of publication
1	Jeff Cody, Francesco Siravo ; Historic Cities – Issues in Urban Conservation; Getty Publications.	2019
2	Ana Pereira Roders, Francesco Bandarin; Reshaping Urban Conservation: The Historic Urban Landscape Approach in Action, Springer.	2019
3	Ayman G. Abdel Tawab ; Introduction to Urban Conservation; Lambert Academic Publishing	2013
4	Nahoum Cohen ; Urban Conservation; MIT Press.	1999

Elective-VI (Semester 2)

AR300120 Advanced Disaster Management	L-T-P 3-0-0 3 credits
Aim: To provide an overview of disasters, critical understanding of the processes and fundamental theories of disaster management in reducing the impact of disasters on settlements and their applications in the context of spatial planning practices. Content: Calamities and Disasters -Introduction: Concepts and definitions of disasters, hazards, calamity risk, vulnerability, resilience and adaptation; Natural Disasters and Manmade Calamities- Statistics, Degree of Damage, Frequency of Occurrences and Other Historical Facts. Types of Disasters- urban disaster, pandemic, complex emergency situation. Classification of Disasters in India by Predominant Types- Earthquake, Flood, Hurricanes, Fires Etc. Overview of disasters across the World. Disaster and biodiversity loss; socio economic aspect of disaster loss. Climate Change and Its Implications in Disaster Mitigation. Cycles of Disasters Management: Stages of disaster; Immediate response, Rescue and Relief; Common issues with Reconstruction; Rehabilitation; Safety, preparedness measures, Mitigation measures; Structural and non- structural measures; role of different agencies in disaster management- Government, INGOs, NGOs and CBOs. Risk, Vulnerability, and coping assessment methods – Disasters in context of development: Understanding risk through livelihood analysis; Factors affecting vulnerability; Differential Impacts of disaster; Ability to recover, coping methods, alternative adjustment processes, Relevance of indigenous knowledge, appropriate technology and local resources; Hazard and vulnerability profile of India; Disaster in context of development projects. Role of SDI and Communities in Disaster Management: Information and data in the context of emergency situation; Role of geospatial tools in the field of disaster management; Community and disasters. Planning for Disaster management: Identification of Disaster-prone areas; Disaster Vulnerability Mapping; Steps for formulating a disaster risk reduction plan; Preparedness of state and district disaster management plan; DM Act and Policy at national and states levels, Relevant policies, Plans, programmes and legislation: Master plans, disaster preparedness, Risk Mitigation and Risk Transfer. Forecasting and Early Warning Systems for Various Types of Disasters; Communication and Information Technology in Disaster Management	
Reference Books:	Year of publication
1 Brenda D. Phillips; Disaster Recovery; CRC Press.	2009
2 Smith, K., David P.; Environmental Hazards: Assessing Risk and Reducing Disaster; 5th Edition Routledge.	2009
3 Pinkowski J.; Disaster Management Handbook; CRC Press.	2008
4 Rodriguez, H., Quarantelli, E., Dynes, R.R.; Handbook of Disaster Research; New York, Springer Science.	2006
5 Living with Risk: A global review of disaster reduction initiatives, United Nations	2004
6 M. Melkumyan, The Behavior of Retrofitted Buildings During Earthquakes: New Technologies, in Building Safer Cities – The Future of Disaster Risk, World Bank	2003
7 A. G. Bigio, Cities and Climate Change, in Building Safer Cities – The Future of Disaster Risk, World Bank	2003
8 Garcia, Belen; Earthquake Architecture: New Construction Techniques for Earthquake Disaster Prevention; Loft Publications.	2001
9 Alexander D.; Confronting Catastrophe: New Perspectives on Natural Disasters New York: Oxford University Press.	2000
10 Guide to practical project appraisal, social benefit, Cost analysis in Developing Countries; United Nations Industrial Development Organization, Vienna.	1986
11 Bhardwaj, R K; The Municipal administration in India: A Sociological analysis of rural & urban India; Sterling Publishers.	1970

<i>AR300221</i> <i>Resilient Urban Planning</i>	L - T - P 3 - 0 - 0 3 c r e d i t s
1. Climate change, science and uncertainties: Overview of climate change modeling and forecasting from IPCC's 4th Assessment Report to the present IPCC 5th Assessment report: current Representative Concentration Pathways and Socio-Economic Scenarios. Likely global and regional manifestations expected by midcentury. 2. Urbanization, processes and projections: Magnitude of urbanization and worldwide progression from 1950 to 2000, projections to 2050. Demographic trends, links with economic and social development, global variations of urbanization. Sustainable urban development priorities in the world contexts 3. Urban greenhouse gas emissions: Urban sources: urban mobility and transportation systems, residential and commercial buildings, production and distribution of goods. Energy sources and urban GHG emissions. Aggregate emissions and forecasts. Urban density, urban form and GHG emissions, intra-urban and inter-urban differentials. GHG emissions and urban lifestyles. 4. Urban vulnerability and climate change impacts: Rapid-onset hazards and slow-onset changes threatening urban territories. Links between natural disasters and climate change impacts. Relevance of geographic location and main manifestations of climate change in cities. Increasing exposure and vulnerability of urban assets and populations, links to socio-economic welfare. Aggregate magnitude of climate change impacts. 5. Adaptation planning for resilient cities: Linkages between urban resilience and adaptation. Institutional response systems and civil preparedness. Resilient infrastructure planning, building and retrofitting. Adapting existing urban areas to climate change. Ecosystem services for adaptation. Urban adaptation action plans. Linkages between adaptation and sustainable urban development in the various global contexts. 6. Mitigation planning for low-carbon cities: Urban planning for GHG mitigation: land-use, densities and urban form. Smart grid and smart cities. Energy efficiency. Designing and constructing the built environment. Transit oriented development. Walkable cities, non-motorized transportation. Mixed-use urban development. Water usage and waste management. Linkages with sustainable urban development. 7. Policy frameworks and climate politics: Climate change and other major challenges of sustainable development. Policy scenarios: limits to growth, green growth, prosperity without growth. UNFCCC and climate negotiations since the Rio 1992 summit. Climate tipping points and public action. A low-carbon future. 8. Planning resilient, low-carbon cities: Successful examples of urban innovations across cities worldwide. The role of urban planners in making resilient, low-carbon cities. Major international initiatives: C40, ICLEI, UNISDR, Rockefeller Foundation, WB and IDB.	

Reference Books:		Y e a r o f p u b l i c a t i o n
1	Cathy Baldwin, Robin King; Social Sustainability, Climate Resilience and Community-Based Urban Development, Routledge, Taylor and Francis Group.	2 0 2 0
2	Vishwa Raj Sharma, Chandrakanta; Making Cities Resilient; Springer.	2 0 1 9
3	Yoshiki Yamagata; Ayyoob Sharifi; Resilience-Oriented Urban Planning: Theoretical and Empirical Insights; Publisher Springer International Publishing.	2 0 1 8
4	Ayda Eraydin, Tuna Taşan-Kok; Resilience Thinking in Urban Planning; Springer.	2 0 1 3
5	Todd W. Miner, Zuzana Stanton-Geddes (edited by Abhas K. Jha); Building Urban Resilience: Principles, Tools, and Practice,	2 0 1 3
6	Cities and Climate change, United Nations HABITAT (UNHABITAT)	2 0 1 1
7	Cities and Climate change, Urban Climate Change Research Network (UCCRN)	2 0 1 1
8	Cities and Climate change, Organization for Economic Cooperation and Development (OECD)	2 0 1 0
9	Simin Davoudi, Jenny Crawford and Abid Mehmood; Planning for Climate Change-Strategies for Mitigation and Adaptation for Spatial Planners; Earthscan	2 0 0 9
10	Wheeler, Stephen; Planning for Sustainability: Creating Livable, Equitable and Ecological Communities. Routledge.	2 0 0 4

Elective-VI (Semester 2)

Elective-VI (Semester 2)

	AR300219 <i>Futuristic and Creative Cities</i>	L - T - P 3 - 0 - 0 3 c r e d i t s
	Aim: The aim of this course is to provide awareness and exposure to the power of emerging new technologies and social networks that has led to changing scenarios in the spatial order of cities and regions with the emergence of virtual societies globally. Course content. 1. Planning and emerging technologies: Traditional settlements to modernity, spatial planning and technology interface, socio-economic planning and technology interface, planning cities and local technologies, technological innovations and responsive city planning, planning responsive technology versus technology responsive planning. 2. City-Technology-Infrastructure: Transportation and technology, water, sanitation and technology, energy efficient technology for home, street, neighbourhoods and city, telecommunication, health and education, security and safety for buildings and people in cities. 3. Techno cities: Types of Futuristic and Creative cities: Floating cities; digital cities, technology parks, Sub Biosphere 2; Paris Smart Cities 2050; Beijing 2050; Garden Bridge, London; OASIS; Paris of the Future; Floating City; Vertical Forest; Planning, design and communication system, socio-economic and environmental impact of Techno Cities. 4. Governance: Role of law and technology, administration and organisation, industry and corporate, communities and people in building smart cities and smart communities, participatory planning. 5. Case Studies: Case studies of examples of futuristic cities around the world in general and India in particular.	
	Reference Books:	Y e a r o f p u b l i c a t i o n

1	Paul Dobraszczyk ; Future Cities: Architecture and the Imagination; Reaktion Books.	2 0 1 9
2	Michael Batty; Inventing Future Cities; The MIT Press.	2 0 1 8
3	Daniel Brook ; A History of Future Cities; W. W. Norton Company.	2 0 1 3
4	Philip N. Cooke, Luciana Lazzeretti: Creative Cities, Cultural Clusters and Local Economic Development; Edward Elgar Publishing.	2 0 0 8