

DEPARTMENT OF PLANNING

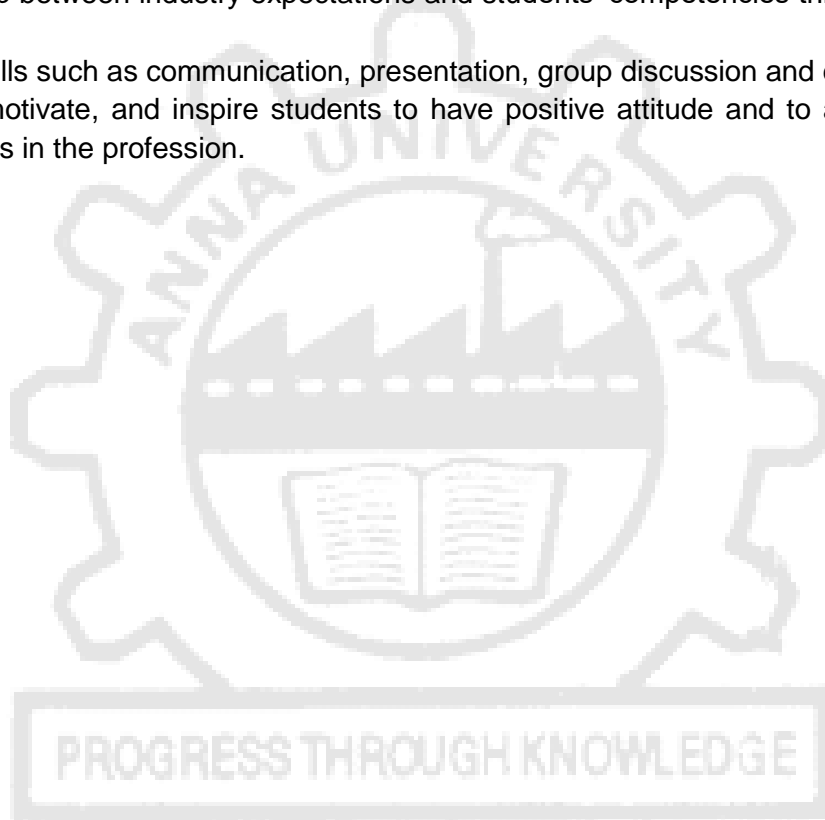
ANNA UNIVERSITY, CHENNAI

VISION:

We envision our students get imparted planning education, which contributes ability to unlock their full potential to enable them to reach the pinnacle of the Profession.

MISSION:

1. Promote the department into a Centre of Excellence through inter disciplinary associations and innovative researches.
2. Strive to instill professional ethics and excellence through effective industry-institute collaboration.
3. Bridge the gap between industry expectations and students' competencies through appropriate training.
4. Impart soft skills such as communication, presentation, group discussion and decision taking.
5. Encourage, motivate, and inspire students to have positive attitude and to aim high to scale greater heights in the profession.



1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

- i) Become an urban and regional planner with knowledge and understanding of the socio-economic, cultural, physical, environmental, political, legal and management aspects of urban and rural settlements.
- ii) Become part of urban and regional planning authorities, local governments, housing development agencies or other related public agencies.
- iii) Become a professional consultant who can independently/jointly offer support in planning and executing the various activities of the planning process.
- iv) Become a researcher to critically investigate planning concepts, theories, and techniques to advocate newer theories, innovative concepts and technology driven analytical tools for better management of human settlements.
- v) Become an activist to influence policies and strategies of the government at various levels for a sustainable development and enhancement in quality of life of the citizens.

2. PROGRAMME OUTCOMES (POs):

After going through four years of study, B.Plan Graduates will exhibit ability to:

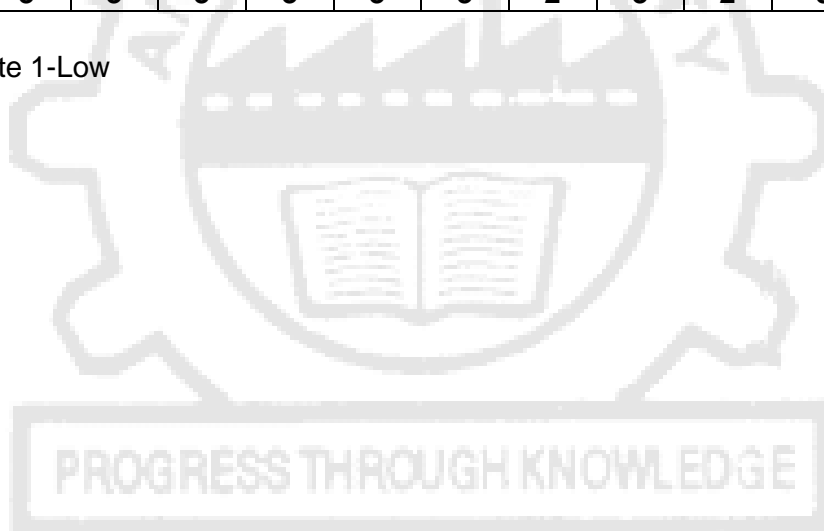
No.	Graduate Attribute	Programme Outcome
PO1	Planning knowledge	An ability to apply the professional knowledge to solve the complex planning problems.
PO2	Problem Analysis	An ability to independently carry out research /investigation and development work to solve practical problems in the field of urban and regional planning and development.
PO3	Design/development of solutions	An ability to demonstrate a degree of mastery over the understanding of the functioning of human settlements at various levels and to articulate contextual planning interventions required for sustainable development.
PO4	Conduct investigations of complex problems	To use research-based knowledge and research methods including planning approaches, analysis and interpretation of data, and synthesis of the information to provide valid solutions.
PO5	Modern tool usage	An ability to create, select and apply appropriate techniques, resources and advanced applications to predict, stimulate and analyses the complex spatial activities.
PO6	The Planner and Society	A willingness to engage in undertaking socially useful activities related to planning and development of neighbourhood, town/city and region with an exposure to best practices in the field of planning and latest technologies as planning tools.
PO7	Environment and sustainability	A level of understanding of socio-economic and environmental consequences of planning strategies and maturity to collectively work in groups and evolve consensual decisions towards achieving principle goals of development.

PO8	Ethics	Serves as a competent and ethical professional planner.
PO9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PO10	Communication	An ability to write and present planning documents, technical reports including plan documents of urban and rural settlements.
PO11	Project Management and Finance	A level of ability and knowledge to participate and strengthen the institutional mechanism for development of the planning education and practice.
PO12	Life-Long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of professional change.

PEO / PO Mapping:

PROGRAMME EDUCATIONAL OBJECTIVES	PROGRAMME OUTCOMES											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
I	3	3	3	2	3	3	2	3	3	3	2	3
II	2	2	2	2	2	3	2	3	3	3	1	2
III	3	3	3	3	2	3	2	2	3	3	2	3
IV	3	3	3	3	3	3	3	2	2	3	3	3
V	3	3	3	3	3	3	2	3	2	3	2	3

3- High 2-Moderate 1-Low



Mapping of Course Outcome and Programme Outcome														
Year	Sem	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
I	1	Fundamentals of Planning	3	2	2	1	1	1	1	1	2	1	1	1
		Demography and Urbanisation	3	2	1	1	1	1	1	1	1	2	1	1
		Introduction to Social Science	3	2	2	3	1	2	2	1	1	1	1	1
		Introduction to Architecture and Building materials	2	2	2	2	3	1	2	1	2	1	2	3
		Planning communication and Technical Drawing	3	3	2	1	2	3	3	2	3	3	1	3
		Basic Computer Applications in Planning	2	2	3	3	3	2	1	1	2	3	3	2
		Planning Studio – I : Area Appreciation and Space Perceptions	3	2	2	2	2	2	2	1	2	3	2	2
	2	Cities in History	3	3	2	3	2	3	2	2	3	2	2	3
		Site and Land Development	3	3	2	3	2	3	2	2	3	2	2	3
		Introduction to Microeconomics	2	2	1	1	1	2	1	1	1	1	2	1
		Technical English	1	1	1	1	1	1	1	2	2	3	1	2
		Surveying and Photogrammetry	2	2	2	2	2	1	1	1	1	1	1	1
		Advanced Visual Planning Techniques	2	2	3	3	3	2	1	1	2	3	3	3
II	3	Planning Studio – II : Village Study and Development	3	2	2	2	2	2	2	1	2	2	3	2
		Planning Theory	3	3	3	3	2	3	2	3	2	2	1	3
		Quantitative and Qualitative methods for Planners	2	3	3	3	3	2	1	1	2	3	3	3
		Urban Housing and Planning	3	3	3	3	2	3	1	2	2	2	2	3
		Environmental Science	2	2	2	2	2	2	3	3	1	2	2	2
		Design Thinking for Planners	2	3	3	3	2	2	1	1	2	2	2	3
Spatial Data Infrastructure for Planning	2	2	2	1	3	1	1	1	2	2	1	3		

		Planning Studio – III: Community Development and Collaborative Planning	2	2	2	2	2	2	3	2	3	3	2	2	
	4	Contemporary Planning Theory	3	3	3	3	2	3	2	3	2	2	1	3	
		Urban Planning and Development	3	2	2	2	2	3	3	1	2	2	1	3	
		Planning for Water Supply and Sanitation	3	2	2	2	2	2	2	1	2	2	2	2	
		Urban Governance	3	3	2	3	2	3	2	2	3	2	2	3	
		Technical Report Writing	2	2	1	1	2	3	1	2	2	3	1	2	
		Urban Mobility and the City	2	2	2	2	1	2	3	3	1	2	2	2	
		Planning Studio – IV: Land Use and Transportation Planning	3	3	3	2	3	3	3	3	3	2	1	3	
III	5	Planning Legislation	2	2	2	2	2	2	1	2	1	2	1	1	
		Infrastructure Planning	3	2	2	3	2	2	2	1	2	1	2	3	
		Planning and Management of Informal Sector	2	2	2	2	1	3	3	1	2	2	1	3	
		Project Formulation, Appraisal and Management	2	3	2	2	2	1	1	1	1	2	2	1	
		Planning Policies and Strategies	2	3	2	2	2	1	1	1	1	2	2	1	
		Planning Studio – V : Master Plan	2	2	2	2	2	2	2	2	2	3	3	2	2
		Professional Elective I													
	6	Planning Practice and Professional Ethics	2	2	1	2	1	1	1	3	1	1	1	1	3
		Land Economics and Land Theory	2	3	2	2	2	2	2	2	2	1	1	1	3
		Basics of Urban Design	2	3	3	2	1	2	2	1	2	2	1	1	3
		Planning Studio – VI : Sub-City Plan	2	2	2	2	2	2	2	2	2	3	3	2	3
		Professional Elective II													
		Professional Elective III													

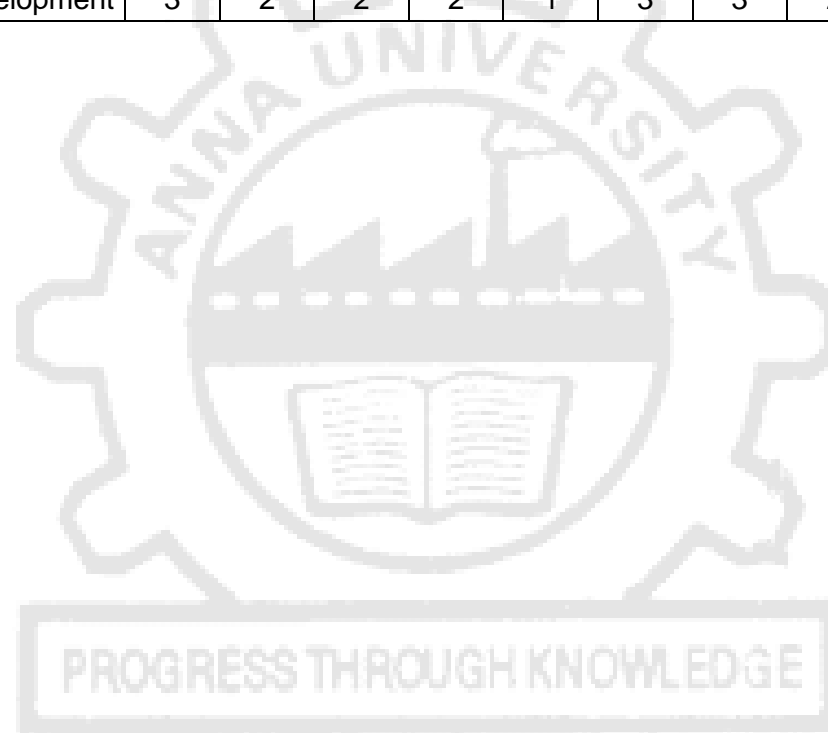
IV	7	Regional Planning and Development	3	2	2	2	1	3	3	1	2	2	1	3
		Urban Finance	2	2	1	1	1	1	1	2	1	1	3	1
		Planning Studio – VII : Regional Plan	3	2	2	3	2	1	3	2	2	2	2	3
		Dissertation	3	2	3	2	2	3	3	3	3	3	3	3
		Professional Elective IV												
		Professional Elective V												
	Internship Training	3	3	2	3	3	2	2	3	3	3	2	3	
8	Thesis	3	2	2	2	2	3	3	2	3	3	3	3	
3- High 2-Moderate 1-Low														



Professional Elective Courses													
S.No	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1.	Street, Places and Active Transport	3	2	1	2	1	1	2	1	1	1	2	1
2.	Climate Resilient Settlement Planning	3	3	3	3	2	3	2	3	2	2	1	3
3.	Advanced Spatial Data Infrastructure in Planning	2	2	2	1	1	1	1	1	2	2	1	3
4.	Cinema and Cities	3	2	3	2	2	2	3	3	1	2	2	2
5.	Public Transportation Systems	3	2	2	2	2	2	1	1	1	1	2	1
6.	Environmental, Social & Gender Action Plan	3	3	3	3	2	3	2	2	2	2	1	3
7.	Simulation in Planning	3	2	2	2	2	2	2	1	2	2	2	3
8.	Disaster Risk Mitigation and Management	2	2	2	2	2	2	3	3	1	2	2	2
9.	Intelligent Transport System (ITS)	3	2	2	2	2	2	1	1	1	1	1	1
10.	Water Sensitive Planning	3	3	3	3	2	3	2	2	3	2	2	3
11.	Web Based Applications in Planning	3	2	1	2	2	2	2	1	2	12	2	2
12.	Development Regulations	2	2	2	2	2	2	3	3	1	2	1.7	2
13.	Transportation Modelling	3	2	2	2	3	2	1	1	1	1	1	1
14.	Landscape Planning	3	3	2	3	2	3	2	2	3	2	2	3
15.	Big Data in Urban Planning	3	2	2	2	2	2	2	1	2	2	2	2
16.	Real Estate Management	2	2	2	2	2	2	3	3	1	2	2	2
17.	Logistics Planning	3	3	2	3	2	2	1	1	1	1	2	1
18.	Energy Accounting and Auditing	2	2	2	1	2	2	3	3	1	2	2	2
19.	Artificial Intelligence in Planning	2	2	2	1	3	1	1	1	2	1	2	2
20.	Urban Renewal and Heritage Conservation	3	2	2	2	3	3	2	2	2	2	2	3
21.	Transport Economics	3	2	2	3	2	3	3	1	1	1	3	3
22.	Environmental Impact Assessment	3	2	2	2	1	3	3	2	2	3	2	3
23.	Drone Mapping for Urban Application	2	2	2	1	3	1	1	1	2	2	1	3
24.	Future Cities	3	3	3	3	2	3	2	3	2	2	1	3
3- High 2-Moderate 1-Low													

Open Elective Courses													
S. No	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1.	Planning and Management of Green and Open Spaces	2	2	2	2	2	2	3	3	1	2	2	2
2.	Tourism Planning and Development	3	2	2	2	1	3	3	2	2	3	2	3

3- High 2-Moderate 1-Low



ANNA UNIVERSITY, CHENNAI
UNIVERSITY DEPARTMENTS
BACHELOR OF PLANNING (B. PLAN) – FULL TIME
REGULATIONS 2023
CHOICE-BASED CREDIT SYSTEM
CURRICULA AND SYLLABI FOR I TO VIII SEMESTERS

SEMESTER I

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3101	Fundamentals of Planning	PCC	3	0	0	3	3
2.	BN3102	Demography and Urbanization	HSC	3	0	0	3	3
3.	BN3103	Introduction to Social Science	HSC	3	0	0	3	3
4.	BN3104	Introduction to Architecture and Building Materials	PCC	3	0	0	3	3
THEORY CUM STUDIO								
5.	BN3111	Planning communication and Technical Drawing	PCC	1	0	4	5	3
6.	BN3112	Basic Computer Applications in Planning	EEC	1	0	4	5	3
STUDIO								
7.	BN3121	Planning Studio – I: Area Appreciation and Space Perceptions	PCC	0	0	10	10	5
TOTAL				12	0	18	30	23

SEMESTER II

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3201	Cities in History	PCC	3	0	0	3	3
2.	BN3202	Site and Land Development	PCC	3	0	0	3	3
3.	BN3203	Introduction to Microeconomics	HSC	3	0	0	3	3
4.	BN3204	Technical English	HSC	2	0	0	2	2
5.		NCC Credit Course Level 1*	-	2	0	0	2	2
THEORY CUM STUDIO								
6.	BN3211	Surveying and Photogrammetry	PCC	1	0	4	5	3
7.	BN3212	Advanced Visual Planning Techniques	EEC	1	0	4	5	3
STUDIO								
8.	BN3221	Planning Studio – II: Village Study and Development	PCC	0	0	10	10	5
TOTAL				12	0	18	30	22

* NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER III

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3301	Planning Theory	PCC	3	0	0	3	3
2.	BN3302	Quantitative and Qualitative Methods for Planners	PCC	3	0	0	3	3
3.	BN3303	Urban Housing and Planning	PCC	3	0	0	3	3
4.	BN3304	Environmental Science	HSC	3	0	0	3	3
5.	BN3305	Design Thinking for Planners	EEC	3	0	0	3	3
THEORY CUM STUDIO								
6.	BN3311	Spatial Data Infrastructure for Planning	EEC	1	0	4	5	3
STUDIO								
7.	BN3321	Planning Studio – III: Community Development and Collaborative Planning	PCC	0	0	10	10	5
TOTAL				17	0	18	35	23

SEMESTER IV

S. NO	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3401	Contemporary Planning Theory	PCC	3	0	0	3	3
2.	BN3402	Urban Planning and Development	PCC	3	0	0	3	3
3.	BN3403	Planning for Water Supply and Sanitation	PCC	3	0	0	3	3
4.	BN3404	Urban Governance	PCC	3	0	0	3	3
5.	BN3405	Technical Report Writing	EEC	3	0	0	3	3
6.		NCC Credit Course Level 2*		3	0	0	3	3#
THEORY CUM STUDIO								
7.	BN3411	Urban Mobility and the City	PCC	1	0	4	5	3
STUDIO								
8.	BN3421	Planning Studio – IV: Land Use and Transportation Planning	PCC	0	0	10	10	5
TOTAL				19	0	14	33	23

* NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER V

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3501	Planning Legislation	PCC	3	0	0	3	3
2.	BN3502	Infrastructure Planning	PCC	3	0	0	3	3
3.	BN3503	Planning and Management of Informal Sector	PCC	3	0	0	3	3
4.	BN3504	Project Formulation, Appraisal and Management	PCC	3	0	0	3	3
5.	BN3505	Planning Policies and Strategies	PCC	3	0	0	3	3
6.		Professional Elective I	PEC	3	0	0	3	3
STUDIO								
7.	BN3521	Planning Studio – V: Master Plan	PCC	0	0	10	10	5
EDUCATIONAL TOUR								
8.	BN3511	Educational Tour	EEC	0	0	0	0	1
TOTAL				18	0	10	28	24

SEMESTER VI

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3601	Planning Practice and Professional Ethics	PCC	3	0	0	3	3
2.	BN3602	Land Economics and Land Theory	PCC	3	0	0	3	3
3.	BN3603	Basics of Urban Design	PCC	3	0	0	3	3
4.		Professional Elective II	PEC	3	0	0	3	3
5.		Professional Elective III	PEC	3	0	0	3	3
6.		Open Elective I	OEC	3	0	0	3	3
7.		NCC Credit Course Level 3*		3	0	0	3	3#
STUDIO								
8.	BN3621	Planning Studio – VI: Sub City Plan	PCC	0	0	10	10	5
TOTAL				18	0	10	28	23

* NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA

SEMESTER VII

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
THEORY								
1.	BN3701	Regional Planning and Development	PCC	3	0	0	3	3
2.	BN3702	Urban Finance	PCC	3	0	0	3	3
3.		Professional Elective IV	PEC	3	0	0	3	3
4.		Professional Elective V	PEC	3	0	0	3	3
5.		Open Elective II	OEC	3	0	0	3	3
STUDIO								
6.	BN3721	Planning Studio – VII: Regional Plan	PCC	0	0	10	10	5
7.	BN3722	Dissertation	EEC	0	0	6	6	3
8.	BN3723	Internship Training	EEC	x	x	x	x	2
TOTAL				15	0	16	31	25

SEMESTER VIII

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
STUDIO								
1.	BN3081	Thesis	EEC	0	0	20	20	10
TOTAL				0	0	20	20	10

TOTAL NO. OF CREDITS: 173

PROFESSIONAL CORE COURSES (PCC)

S. NO	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3101	Fundamentals of Planning	PCC	3	0	0	3	3
2.	BN3104	Introduction to Architecture and Building Materials	PCC	3	0	0	3	3
3.	BN3111	Planning Communication and Technical Drawing	PCC	1	0	4	5	3
4.	BN3121	Planning Studio – I: Area Appreciation and Space Perceptions	PCC	0	0	10	10	5
5.	BN3201	Cities in History	PCC	3	0	0	3	3
6.	BN3202	Site and Land Development	PCC	3	0	0	3	3
7.	BN3211	Surveying and Photogrammetry	PCC	1	0	4	5	3
8.	BN3221	Planning Studio – II: Village Study and Development	PCC	0	0	10	10	5
9.	BN3301	Planning Theory	PCC	3	0	0	3	3
10.	BN3302	Quantitative and Qualitative Methods for Planners	PCC	3	0	0	3	3

11.	BN3303	Urban Housing and Planning	PCC	3	0	0	3	3
12.	BN3321	Planning Studio – III: Community Development and Collaborative Planning	PCC	0	0	10	10	5
13.	BN3401	Contemporary Planning Theory	PCC	3	0	0	3	3
14.	BN3402	Urban Planning and Development	PCC	3	0	0	3	3
15.	BN3403	Planning for Water Supply and Sanitation	PCC	3	0	0	3	3
16.	BN3404	Urban Governance	PCC	3	0	0	3	3
17.	BN3411	Urban Mobility and the City	PCC	1	0	4	5	3
18.	BN3421	Planning Studio – IV: Land use and Transportation Planning	PCC	0	0	10	10	5
19.	BN3501	Planning Legislation	PCC	3	0	0	3	3
20.	BN3502	Infrastructure Planning	PCC	3	0	0	3	3
21.	BN3503	Planning and Management of Informal Sector	PCC	3	0	0	3	3
22.	BN3504	Project Formulation, Appraisal and Management	PCC	3	0	0	3	3
23.	BN3505	Planning Policies and Strategies	PCC	3	0	0	3	3
24.	BN3521	Planning Studio – V: Master Plan	PCC	0	0	10	10	5
25.	BN3601	Planning Practice and Professional Ethics	PCC	3	0	0	3	3
26.	BN3602	Land Economics and Land Theory	PCC	3	0	0	3	3
27.	BN3603	Basics of Urban Design	PCC	3	0	0	3	3
28.	BN3621	Planning Studio – VI: Sub-City Plan	PCC	0	0	10	10	5
29.	BN3701	Regional Planning and Development	PCC	3	0	0	3	3
30.	BN3702	Urban Finance	PCC	3	0	0	3	3
31.	BN3721	Planning Studio – VII	PCC	0	0	10	10	5
							TOTAL	107

VERTICALS OF PROFESSIONAL ELECTIVES

SEMESTER & ELECTIVE	TRANSPORTATION PLANNING	ENVIRONMENTAL PLANNING	ADVANCED TECHNOLOGIES FOR PLANNING	HABITAT PLANNING & URBAN DESIGN
5th Semester PEC I	Street, Places and Active Transport	Climate Resilient Settlement Planning	Advanced Spatial Data Infrastructure for Planning	Cinema and Cities
6th Semester PEC II	Public Transportation Systems	Environmental, Social & Gender Action Plan	Simulation in Planning	Disaster Risk Mitigation and Management
6th Semester PEC III	Intelligent Transport System (ITS)	Water Sensitive Planning	Web Based Applications in Planning	Development Regulations
7th Semester PEC IV	Urban Transportation Modelling	Landscape Planning	Big Data in Urban Planning	Real Estate Management
7th Semester PEC V	Logistics Planning	Energy Accounting and Auditing	Artificial Intelligence in Planning	Urban Renewal and Heritage Conservation
	Transport Economics	Environmental Impact Assessment	Drone Mapping for Urban Application	Future Cities

PROFESSIONAL ELECTIVE COURSES (PEC)

SEMESTER V – ELECTIVE I

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3001	Street, Places and Active Transport	PEC	3	0	0	3	3
2.	BN3002	Climate Resilient Settlement Planning	PEC	3	0	0	3	3
3.	BN3003	Advanced Spatial Data Infrastructure in Planning	PEC	1	0	4	5	3
4.	BN3004	Cinema and Cities	PEC	3	0	0	3	3

SEMESTER VI – ELECTIVE II

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3005	Public Transportation Systems	PEC	3	0	0	3	3
2.	BN3006	Environmental, Social and Gender Action Plan	PEC	3	0	0	3	3
3.	BN3007	Simulation in Planning	PEC	1	0	4	5	3
4.	BN3008	Disaster Risk Mitigation and Management	PEC	3	0	0	3	3

SEMESTER VI – ELECTIVE III

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3009	Intelligent Transport System (ITS)	PEC	3	0	0	3	3
2.	BN3010	Water Sensitive Planning	PEC	3	0	0	3	3
3.	BN3011	Web Based Applications in Planning	PEC	1	0	4	5	3
4.	BN3012	Development Regulations	PEC	3	0	0	3	3

SEMESTER VII – ELECTIVE IV

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3013	Transportation Modelling	PEC	3	0	0	3	3
2.	BN3014	Landscape Planning	PEC	3	0	0	3	3
3.	BN3015	Big Data in Urban Planning	PEC	3	0	0	3	3
4.	BN3016	Real Estate Management	PEC	3	0	0	3	3

SEMESTER VII – ELECTIVE V

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3017	Logistics Planning	PEC	3	0	0	3	3
2.	BN3018	Energy Accounting and Auditing	PEC	3	0	0	3	3
3.	BN3019	Artificial Intelligence in Planning	PEC	3	0	0	3	3
4.	BN3020	Urban Renewal and Heritage Conservation	PEC	3	0	0	3	3
5.	BN3021	Transport Economics	PEC	3	0	0	3	3
6.	BN3022	Environmental Impact Assessment	PEC	3	0	0	3	3
7.	BN3023	Drone Mapping for Urban Application	PEC	1	0	4	5	3
8.	BN3024	Future Cities	PEC	3	0	0	3	3

HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES (HSC)

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1	BN3102	Introduction to Social Science	HSC	3	0	0	3	3
2	BN3103	Demography and Urbanisation	HSC	3	0	0	3	3
3	BN3203	Introduction to Microeconomics	HSC	3	0	0	3	3
4	BN3204	Technical English	HSC	2	0	0	2	2
5	BN3304	Environmental Science	HSC	3	0	0	3	3

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
1.	BN3112	Basic Computer Applications in Planning	EEC	1	0	4	5	3
2.	BN3212	Advanced Visual Planning and Techniques	EEC	1	0	4	5	3
3.	BN3305	Design Thinking for Planners	EEC	3	0	0	3	3
4.	BN3311	Spatial Data Infrastructure for Planning	EEC	1	0	4	5	3
5.	BN3405	Technical Report Writing	EEC	3	0	0	3	3
6.	BN3511	Educational Tour	EEC	0	0	0	0	1
7.	BN3722	Dissertation	EEC	0	0	6	6	3
8.	BN3723	Internship Training	EEC	0	0	0	0	0
9.	BN3081	Thesis	EEC	0	0	20	20	10
TOTAL							31	31

OPEN ELECTIVE COURSES (OEC)

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P/S		
Open Elective – I								
1.	OBN351	Planning and Management of Green and Open Spaces	OEC	3	0	0	3	3
Open Elective – II								
2.	OBN352	Tourism Planning and Management	OEC	3	0	0	3	3

SUMMARY

S. No.	Category	Credits per Semester								Credits Total	Percentage
		I	II	III	IV	V	VI	VII	VIII		
1.	HSC	6	5	3	-	-	-	-	-	14	8
2.	EEC	3	3	6	3	1	-	5	10	31	18
3.	PCC	14	14	14	20	20	14	11	-	107	62
4.	PEC	-	-	-	-	3	6	6	-	15	9
5.	OEC	-	-	-	-	-	3	3	-	6	3
Total		23	22	23	23	24	23	25	10	173	100

OBJECTIVES

- To introduce to students, the basic concepts, and rationales of planning.
- To familiarize students with basic planning terminology.
- To understand the plan making processes, levels of planning
- To provide overview of planning practice and actions in India.
- To introduce the hierarchy of development plans and planning process

UNIT I DEFINITIONS AND RATIONALES OF PLANNING**9**

Definition of Urban and Rural; Basic definitions and frequently used terminology in planning – land use, demography, physical infrastructure, social infrastructure and housing, Goals, objectives, and components of planning; Benefits of planning; Planning as a discipline and multidisciplinary nature of planning; Different roles of planners.

UNIT II FOUNDATIONS OF PLANNING & LEVELS OF PLANNING**9**

Orthodoxies of planning, Components of sustainable urban and regional development; Reasoning and its forms in planning; Planning knowledge and its various forms; Arguments for and against planning; Economic and social aspects as bases of town and country planning, Constitution of India; Nature of the Indian federal structure; Hierarchy of administrative boundaries in India; Various levels of Planning; Reasoning and its various in planning -space, place, and location.

UNIT III SOURCING INFORMATION IN PLANNING**9**

Census of India, National Sample Survey organization, Basics of web-based information portals, datasets as raw information sources and guidelines adopted in planning

UNIT IV DEVELOPMENT PLANS**9**

Need for Hierarchy of plans – Types and Scope of various scales of plans –Perspective Plan, Regional Plan – Block Development Plan - Structural Plan, Master Plan, Detailed Development Plan/Zonal Plan/Town Planning Schemes – Local Area Plan - Layouts – Significance of plans – Case studies

UNIT V PLANNING PROCESS**9**

Planning system in India - Institutional mechanism, Plan making process – Delineation of planning area, Assessment of developmental issues, Plan period, Formulation of aim and objectives, Projection of requirements, Development proposals and phasing - Public Participation - Constraints in plan preparation and implementation - Planning Process in the formulation and implementation of development plans

TOTAL: 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Able to understand the influence of planning as a profession and its correlation with other disciplines
- CO2** Demonstrate understanding about the foundational concepts and terminologies used in planning
- CO3** Expose about planning process and justify the rationale of spatial planning
- CO4** Acquire knowledge on various information sources and guidelines
- CO5** Able to distinguish the scope and level of planning.
- CO6** Acquire knowledge on types of development plans, planning organizations and Governance of Planning

TEXT BOOKS

1. Jain, A.K. "Town Planning," Khanna Book Publishing Co., New Delhi, 2020
2. Branch, M.C, 'Comprehensive City Planning: Introduction and Explanation,' Routledge, 2018

3. G.K.Hiraskar, "Fundamentals of Town Planning", Dhanpat Rai Publications, 2012.
4. John Ratcliffe, "An Introduction to Town and Country Planning", Hutchinson, 1985.
5. Anthony James Catanese and James C.Synder, "Introduction to Urban Planning", McGraw-Hill, Inc,US, 1988.
6. Patel, S.B, "Urban Planning by Objectives, Economic and Political Weekly," Vol. 32, No. 16, pp. 822-826, 1997

REFERENCES

1. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines,"2015
2. Government of India, "Rural Area Development Plan Formulation and Implementation (RADPFI) Guidelines,"2021
3. Baer, W.C., "General Plan Evaluation Criteria: An Approach to Making Better Plans", Journal of the American Planning Association, Vol. 63, Issue 3, pp. 329-344, 2007
4. Kasarda, J.D., and Crenshaw, E.M., "Third World Urbanization: Dimensions, Theories, and Determinants," Annual Review of Sociology, Vol. 17, pp. 467-501 ,1991
5. Klosterman, R.E., "Arguments for and Against Planning, Town Planning Review," Vol. 56, No. 1, pp. 5-20, 1985
6. Amiya Kumar Das, "Urban Planning in India", Rawat Publications, 2007.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1		2	2	1	2	1		
CO2	3	2	1	1	1	1	1			1		1
CO3	3	2	2	1		1	1	1	1			1
CO4	3	2	2	1		1	1			1	1	
CO5	3	2	2	1		1	1	1	2		1	
CO6	3	2	2	1	1	1	1	1	1	1	1	2
Average	3	2	2	1	1	1	1	1	2	1	1	1

3- High 2-Moderate 1-Low

BN3102

DEMOGRAPHY AND URBANISATION

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the basic concept and definitions of the key terms of the population studies and to remember the demographic trends at the global, national, regional and the city level.
- To understand the trends of vital statistics, analyse the population forecasting techniques and creation of cohort tables.
- To understand the basic terms of urbanization and analyse the trend of urbanization at international, national, state, and regional level.
- To analyse the various concepts of any settlement system and evaluate the role of urban settlements
- To formulate policies and strategies for directing the trend of urbanization in the desired pattern in India.

UNIT I STUDY OF POPULATION

10

Evolution of population studies, Demographic approaches and key demographic principles including study of population size, determinants of population size, population structure and composition - sex composition, sex ratio, child -woman ratio, measures of age -sex structure, age-sex pyramid; Spatial distribution of population, measures of population distribution and concentration, factors affecting population distribution and density; Demographic trends at global, national, regional and city scale; Census definitions, levels and types of demographic data, methods and sources of demographic data, accessing and using census information available at various levels

UNIT II VITAL DEMOGRAPHIC STATISTICS 10

Trends of vital statistics such as fertility, mortality, migration, demographic balancing equation; Defining migration, theories of migration and population movement, types and effects of migration, migration trends in developing countries; Population growth and decline; Techniques of population projections and forecast; Advantages and limitations, Concept of life table, techniques for preparing life table, its uses and limitations; Computation of survival rates, life expectancy; Concept of cohorts and generation of cohort table and its uses.

UNIT III URBANIZATION TRENDS AND PATTERNS 9

Definition of Human settlement, Urban area, Town, City, Urbanization, Suburbanization, Urban sprawl, Peri-urban areas, Central Business District (CBD), Classification of urban areas; Trend of Urbanisation at International, National, Regional and State level.

UNIT IV SETTLEMENT SYSTEM AND ROLE OF URBAN AREA 9

Settlement system, primate city, rank-size rule, central place concept, concepts of complementary area, central goods and services, range, threshold etc.; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; its structure, stages of growth, its role in urban growth; urbanization, industrialization, and urban development; push and pull factors; migration trends and impacts on urban and rural development.

UNIT V POLICIES AND STRATEGIES FOR DIRECTING URBANIZATION TRENDS IN INDIA 7

Urbanization policy, basic issues in urbanization policy; role of national and state level policies; five-year plans, latest attempts at urbanization policy formulation in the country, Impact of Urbanization on cities and towns, challenges for urban planners.

TOTAL: 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would have the ability to:

- CO1** Develop basic understanding of demography approaches and principles
- CO2** Build knowledge on vital demographic statistics
- CO3** Decipher and analyse important demographic aspects for preparing development plans.
- CO4** Demonstrate skills to examine vital demographic data from diverse sources and analyse them through various tools
- CO5** Understand concepts of urbanization and settlement system
- CO6** Disseminate knowledge on urbanization policies and plans, and their relationship with planning.

TEXT BOOKS

1. Weinstein, J. and Pillai, V.K, "Demography: The Science of Population," Second Edition, Rawat Publications, Jaipur ,2017
2. Dudley L.Poston Jr, "Handbook of Population", Springer , 2019
3. Ramachandran, R, "Urbanization and Urban Systems in India," Oxford University Press, New Delhi.,1989
4. Sivaramakrishnan, K.C., Kundu, A. and Singh, B.N. "A Handbook of Urbanization in India," Oxford University Press, New Delhi ,2007
5. Juha Alho, Bruce Spencer, "Statistical Demography and Forecasting," Springer Science & Business Media,2005

REFERENCES

1. Ahluwalia, I.J., Kanbur, R. and Mohanty, P.K. (eds.), "Urbanisation in India: Challenges, Opportunities and the Way Forward", Sage, New Delhi, 2014
2. Bose, A., Singh, V.K., Adhikary, M. and Haldar, A., "Demographic Diversity of India: 1991 Census State and District Level Data", South Asia Books, New Delhi., 1992
3. Majumdar, P.K., "India's Demography: Changing Demographic Scenario in India", Rawat Publications, Jaipur,2013

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1								
CO2	3	2	1	1			1	1	1		1	1
CO3	3	2	1	1	1		1	1	1	2	1	1
CO4	3	2	1	1	1		1	1	1	2	1	1
CO5	3	2	1	1		1	1					
CO6	3	2			1	1	1				1	
Average	3	2	1	1	1	1	1	1	1	2	1	1

3- High 2-Moderate 1-Low

BN3103

INTRODUCTION TO SOCIAL SCIENCE

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the definition of basic terms in urban sociology and the impact of the socio-economic indicators on urban and the regional planning.
- To understand various urban social theories and apply their relevance to planning.
- To recognize various social structures and institutions and analyse their relationship with the urban and rural communities.
- To understand social problems in an urban community and its impacts
- To familiarize with political science and political theory

UNIT I INTRODUCTION: THE FIELD OF SOCIOLOGY IN URBAN PLANNING 9

Introduction to Urban Sociology & Rural Sociology – meaning and importance; Origin and development of urban societies. Some Basic Concepts: urbanization, urbanism, Rural-Urban Continuum, conurbation, suburbanization, urban neighborhood, urban ecology; Basic features of Indian society and culture

UNIT II URBAN SOCIAL STRUCTURE 9

Urban Community and Its Elements; Social systems, Social Institutions and their functions, Social Groups and Segregation; Urban and Rural Society; Urban Inequalities: Caste, Class, And Ethnic Segregation of Space. Links Between Sociology and Planning.

UNIT III URBAN SOCIAL THEORY 9

Traditional and modern theories of sociology; methods of investigation and understanding society, man, and environment; social mobility and social – inclusiveness and exclusion

UNIT IV URBANISATION AND SOCIOLOGY 9

Urbanisation trends in the Global, Asian, and Indian text; Urbanisation and housing – housing needs in context to changing family structure and life style, social segregation, and integration; Social impact assessment of urban development, social problems in urban community -informal settlements, and inclusion issues, resettlement, and rehabilitation

UNIT V CITY MAKING: THE POLITICS OF URBAN FORM 9

Political Science and Theory Politics and political theory; Basic understanding of the concepts of freedom, liberalism, and neoliberalism; Equity and Equality, Social Justice, Rights and Citizenship, The Right to The City and Village.

TOTAL: 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would have the ability to:

- CO1** Develop basic understanding of sociology and its principles and its relation in urban context

- CO2** Develop basic understanding of the social structure, society and comprehend the links the between sociology and planning
- CO3** Acquire a conceptual and theoretical framework of social theory and structure in urban context
- CO4** Comprehend the social problems in urban context
- CO5** Able to understand the basics of political theory and interactions with planning
- CO6** Apply the sociological aspects in any development plan, projects, and practices & assess its impacts

TEXT BOOKS

1. N Jayabalan, "Urban Sociology", Atlantic Publishers, and Distributers, 2002
2. Rajendra Kumar Sharma, "Rural Sociology," Atlantic Publishers, and Distributors (P) Ltd,2022.
3. Giffings, Franklin, Henery, "Elements of Sociology", Macmillan & Co Ltd, London
4. TK Oommen & CN Venugopal, "Sociology," Eastern Book Company, 2001
5. AK Sinha, Ratika Thakur, Avanee Khatri, "Social Impact Assessment in India", Sage Spectrum, 2022
6. VD Mahajan, "Political Theory," S. Chand, 2013

REFERENCES

1. Gyoujin Cho, "Global Review of Human Settlements," Pregamon Press, London, 1976
2. R C Agarwal Political Theory, "Principles of Political Science," S. Chand, 1976
3. Samuel Golding, "Urban Sociology and Urbanization," Wilford Press, 2018
4. Castells Manuel and A. Sheridan, "The Urban Question," London: Edward Arnold, 1977.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	3		2	2	1				
CO2	3	1	2	3		2	1	1	1			
CO3	3	2	2	3		2	1	1				
CO4	3	2	2	3		2	2	1		1	1	1
CO5	2	2	1	2		2	1				1	
CO6	3	2	1	2	1	2	2		1	1	2	2
Average	3	2	2	3	1	2	2	1	1	1	1	2

3- High 2-Moderate 1-Low

PROGRESS THROUGH KNOWLEDGE

**BN3104 INTRODUCTION TO ARCHITECTURE AND BUILDING MATERIALS L T P/S C
3 0 0 3**

OBJECTIVES

- To understand the origin and evolution of architecture as a response to the needs, culture, environment, and psychology of human society.
- To identify and utilize the attributes and principles of form, as fundamental tools for generating architectural designs.
- To develop the ability to organize form and space effectively, considering spatial hierarchies, movement, circulation, and the integration of built form with open spaces.
- To understand the properties, characteristics, strength, manufacture, processing and application of various materials.
- To involve students in a number of drawing exercises that will analyze the various building components in a simple load-bearing structure.

UNIT I INTRODUCTION TO ARCHITECTURE 9

Origin and definitions of architecture as need based, cultural, environmental, social, psychological response of human society. Architecture as phenomenological mediation of nature. Components of architecture: use, means, site, shelter, relation to nature, structure, skin, materials, services, circulation, typology, aesthetics, expression, character, symbolism, experience, etc., Understanding form in all its attributes as the basis of creating architecture. Characteristics of form, Form as embodied in and/or constituted by geometric elements such as point, line, plane, volumes. Attributes, generation and interrelationships among elements, Architectural use of elements. Exercises and architectural case studies.

UNIT II ATTRIBUTES AND PRINCIPLES OF FORM 6

Form as manifesting attributes such as pattern, light, colour, surface, texture. Effects of these attributes. Form in its basic state, in combinations, composite organisations and configurations as manifesting characteristics such as proportion, scale, balance, symmetry, asymmetry, rhythm, axis, hierarchy, datum, unity, harmony, dominance, climax, focus. Characteristics acting as principles to generate architectural design. Exercises and architectural case studies

UNIT III ORGANISATION OF FORM AND SPACE 9

Cognitive experience of form and space in architecture –enclosure, internal and external spaces, continuous spaces, hierarchy of spaces, spatial organisation (centralised, linear, radial, clustered, grid), built form- open space relationships. Relationship of movement/ circulation/ path with reference to architectural form and space. Haptic experience. Exercises and architectural case studies.

UNIT IV LIME, STONE, MUD AND BRICK FOR STRUCTURAL USE AND FINISHES 12

Lime as basic binding material/mortar. Mud as basic material for construction, Mud plaster and mortar. Mud walls construction - cob, rammed earth, wattle and daub, adobe, compressed stabilised earthen blocks. Foundation and plinth for mud structures. Basic principles of masonry with stone. Different types of stone masonry walls. Mortar, plastering, pointing and finishes for stone masonry. Structural use of stone masonry in foundation, walls, piers, columns, arches and lintels. Basic principles of masonry with brick. Types of brick bonding. Mortar, plastering, pointing and finishes for brick masonry. Structural use of brick masonry in foundation, walls, piers, columns, arches and lintels.

UNIT V CONCRETE CONSTRUCTION, STEEL AND GLASS BASICS 9

Elements for concrete and type- components of concrete structures - properties and tests on materials Construction details of RCC frames- types of foundations, beams, columns, slabs, walls, lintels and sun shades, sump, water tank, flooring. Construction principles and procedures for structural building components using steel of different sections. Components to include foundations, columns, beams, staircases, roofs (different types of trusses, space frames, geodesic dome, space frame, Steel curtain wall glazing etc), roofing and glazing material. Connections between the different components and fixing. Drawings/ models of the principles.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the origin, definitions, and components of architecture, including its relationship to human society, culture, environment, and psychology.
- CO2** Explore the attributes and principles of form, such as proportion, balance, rhythm, and harmony, and utilize them as guiding principles to generate architectural designs.
- CO3** Develop the skills to organize form and space effectively.
- CO4** Apply theoretical knowledge to practical design challenges and developing innovative and contextually responsive architectural solutions.
- CO5** Familiarize about the construction details of the basic building materials.
- CO6** Understand the mechanism of load transfer in buildings and the importance of various structural materials

TEXT BOOKS

1. Geoffrey Broadbent, 'Design in Architecture - Architecture and the Human Sciences', D.Fulton, 1988.
2. Francis D.K. Ching, 'Architecture-Form, Space and Order', Van Nostrand Reinhold Company, New York, 2007.
3. Simon Unwin, 'Analysing Architecture', Routledge, London, 2003.
4. V.S. Pramar, 'Design Fundamentals in Architecture', Somaiya Publications Private Ltd., New Delhi, 1973.
5. S.P Arora and S.P. Bindra, 'Text book of Building Construction,' Ganpat Rai publications (P) Ltd New Delhi - 110002, 2005.
6. Dr. B.C.Punmia, 'A Text book of Building Construction,' Laxmi Publications Pvt. Ltd., New Delhi, 2001.

REFERENCES

1. Yatin Pandya, 'Elements of Space Making', Mapin, 2008.
2. Francis D.K. Ching, James F. Eckler, 'Introduction to Architecture', Wiley, 2012.
3. Robert McCarter, Juhani Pallasmaa, 'Understanding Architecture', Phaidon 2012.
4. P.C. Varghese, 'Building Materials', Prentice Hall of India put Ltd New Delhi 110001, 2005.
5. Don A. Watson, 'Construction Materials and Processes,' Megraw Hill 1972, WB Mckey Building construction vol 1,2, Longman UK 1981.
6. M.S. Shetty, 'Concrete Technology,' S. Chand & Co.ltd,New Delhi,1986.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2		2	1	3		3		3			3
CO2	2		3	1	3	1	3	1	2			2
CO3		2			3		2				1	2
CO4	2		3	2	2		2					3
CO5	2	2	2		2	1	2	1	2	1	2	3
CO6	2		1	2	2	2	1	2	1			2
Average	2	2	2	2	3	1	2	1	2	1	2	3

3- High 2-Moderate 1-Low

PROGRESS THROUGH KNOWLEDGE

BN3111 PLANNING COMMUNICATION AND TECHNICAL DRAWING

L T P/S C
1 0 4 3

OBJECTIVES

- To learn the techniques, methodologies and tools to convey planning ideas.
- To know how to represents lines, shapes, letters & numbers in drawing sheet.
- To select and use photographic equipment and technologies appropriate to the task.
- To make the students acquire the skills and knowledge to enable them communicate more confidently and effectively using assertive behavior techniques.
- To understand the different aspects of communication.

UNIT I VISUAL COMMUNICATION

15

Visual studies about use of line, shape, form, texture, color, composition, and scale in cities and buildings, streets, cities with special emphasis on rhythms, balance, harmony and proportion etc.; Sketching as a tool for communication.

UNIT II TECHNICAL DRAWINGS **20**
Introduction to Drafting principles and techniques, to develop lettering and dimensioning styles and sheet format for presentation. Introduction to scales and its types. Architectural Drawings: Plans, Elevations, Sections.

UNIT III VERBAL COMMUNICATION **10**
Language and communication; Differences between speech and writing, distinct features of speech; Body language, eye contact, speech, and spoken expression, Elements of a good verbal presentation.

UNIT IV PHOTOGRAPHY AND MODEL MAKING **15**
Photography as a tool for visual information; Images and history; Developing basic understanding of photography, use of camera and its functions; Elements of good photographs; Understanding of different materials for models and built form models to understand the concepts learnt in the studio; A study of basic land and built forms through models, and presentation models.

UNIT V INTERPERSONAL COMMUNICATION, LEARNING SKILLS, SELF-AWARENESS **15**
Listening as an active skill; Types of listeners; Listening for general content; Listening to fill up information; Intensive listening; Listening for specific information; Can intensive listening improve understanding.

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Ability to understand the relationship between geometry and built form.
- CO2** Understand the various attributes of geometric forms and skill in their creation and dissection.
- CO3** Ability to project thoughts towards the future through diagrams.
- CO4** Enhance skills in oral communication, supported by effective analysis, under real-world time constraints and professional expectations
- CO5** Discover the variety of materials to construct architectural models and different geometrical forms.
- CO6** Examine the use of photography as a disciplined way of seeing, of investigating landscapes and expressing ideas.

TEXT BOOKS

1. Susan Sontag, "On Photography", Penguin Classics, 2008.
2. Jardin.V, "Street Photography: Creative Vision behind the Lens", Routledge, New York, 2017.
3. Goleman D, "Emotional Intelligence", Bloomsbury, New York, 2009.
4. Hashimoto A and Clayton M, "Visual Design Fundamentals: A Digital Approach", Charles River Media, Needham Heights, M.A, 2009
5. Francis D.K. Ching, "Architectural Graphics", John Wiley and Sons, 2009.

REFERENCES

1. Rendow Yee, "Architecture Drawing: A Visual Compendium of Types and Methods", John Wiley and Sons, 2012.
2. Alan F. Blackwell, 'Thinking with Diagrams', Springer, 2001.
3. Peter B. Hales, "Silver Cities: Photographing American Urbanization", Albuquerque: University of New Mexico Press, 2005.
4. Wilson, L., & Ogden, J., "Strategic communications planning for effective public relations and marketing (6th ed.)", Dubuque, Iowa: Kendall Hunt Publishing Company, 2014.
5. Jacobs, Allan B. "Starting to Look." In *Looking at Cities*. Cambridge: Harvard University Press, 1985.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	3	2	2	2	1	2	1	2
CO2	3	3	2	1	2	3	3	2	3	3	1	3
CO3	1	1	3		3		1		2	1	2	3
CO4	3		2		3	2		1	3	1	3	3
CO5	2	3	3	2	3		1		2	3	2	2
CO6	3	3	2		1	3	2		3	3	3	3
Average	3	3	2	1	2	3	3	2	3	3	1	3

3- High 2-Moderate 1-Low

BN3112 BASIC COMPUTER APPLICATIONS IN PLANNING **L T P/S C**
1 0 4 3

OBJECTIVES

- To develop practical skills in utilizing advanced features of Word
- To enhance proficiency in creating professional presentations, by learning techniques for data visualization to create visually compelling and engaging presentations.
- To acquire a comprehensive understanding of advanced features of spreadsheet, enabling efficient data processing and analysis for planning purposes.
- To develop fundamental knowledge and skills in 2D drafting, facilitating accurate and precise drafting for planning purposes.
- To familiarize with the basics of image editing, enabling the creation of visually appealing graphics for planning presentations and and documentation.

UNIT I FEATURES OF WORD PROCESSOR 15

Introduction to Computer Application in Planning; Various Software packages, Current trends in Planning Profession with respect to usage of computer application. Usage of Word in report preparation, Adding and Updating Table of Content, Spell Check, Thesaurus, Working with Columns, Tabs & Indents, Creation & Working with Tables, Margins & Space management in Document, Adding References and Graphics, Importing and exporting to and from various formats, Creating questionnaires using macros

UNIT II PRESENTATION TECHNIQUES 15

Data visualizations, Formatting, Slides & Layouts, Text and Tables, Pictures & graphics, Hyperlinks, Add Animations and Transitions.

UNIT III DATA ANALYSIS IN SPREADSHEET 15

Defining Data and Database Management, Working with Census Data, Data analysis using various Functions and tools, creating formulas, using formulas, cell references, replication, sorting, filtering, Functions, Preparation of charts and graphs, Creating trend lines, Simple Macros.

UNIT IV BASICS OF 2D DRAFTING 15

Concept of Mapping and Drafting techniques; Introduction to drafting techniques; Understand the fundamental concepts and the terminologies used; Tools for digitization; Modifying tools; Layer creation and management; Creating Blocks; Annotation; Scaling; Plotting and Printing and hand-on exercises.

UNIT V INTRODUCTION TO IMAGE EDITING 15

Basics of Image editing –User Interface – Pixel vs Vectors – File Formats – Essential Elements of Design, Composition, Representation

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Apply advanced features of Word to create professional documents by utilizing software tools effectively.
- CO2** Design visually compelling and engaging presentations by employing data visualization techniques and showcasing effective communication skills
- CO3** Analyze and interpret data using advanced functions and tools in Spreadsheets for informed decision-making in planning tasks.
- CO4** Apply drafting techniques to produce accurate and precise mapping and drafting, by employing tools for digitization.
- CO5** Create visually appealing and well-composed graphics in planning presentations.
- CO6** Apply critical thinking skills to identify and solve computer application-related problems in planning.

TEXT BOOKS

1. Anderson, T. and Hart Davis, G., 'Beginning Microsoft Word,' Springer, New York, 2010
2. Bill, J, 'Advance Excel 2016 in Depth,' BPB Publications, New Delhi, 2016.
3. Fitzgerald, J. and Richard, P, 'Introduction to AutoCAD,' Pearson Education, London, 2016.
4. Tickoo, S, 'AutoCAD 2020 Workbook,' BPB Publications, New Delhi, 2019.
5. Adobe Photoshop-'Classroom in a Book 1st Edition, Adobe Creative Team', Pearson Publication, 2013.

REFERENCES

1. Humphrey, M.L., 'Excel for Beginners,' Volume 1 of Excel Essentials, 2017
2. Robert Shufflebotham, 'Photoshop in Easy Steps,' 1st Edition, Tata Mc Graw-Hill Publication, 2013
3. Internet technology and Web Design, ISRD group, Tata Mc Graw-Hill, 2013

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1			2	1			2	2		2
CO2	2		2		3				1	3		2
CO3	2	3	3	3	3				2	3	3	1
CO4	2	2	3	2	3	2		1	3	3		3
CO5			3		3				2	3		3
CO6	2	2	3	3	3		1	1	3	3	3	3
Average	2	2	3	3	3	2	1	1	2	3	3	2

3- High 2-Moderate 1-Low

BN3121 PLANNING STUDIO I: AREA APPRECIATION AND SPACE PERCEPTIONS L T P/S C
0 0 10 5

OBJECTIVES

- To understand various building blocks, and city planning elements using movies, lectures and tours.
- To understand distance and area and drawing the same to scale.
- To study the built forms of various areas with different characteristics and analyses how the built forms support their activities.
- To show ability to observe, record, map and present different activities and spaces. Comprehend the characteristics of form and space.
- To Evaluate and formulate the neighborhood plan manually and digitally.

CONTENT

Introduction to Maps: Types of maps - political, cadastral, topographic, resource, network and transportation.

Cartography and Map Making: Formulation of maps, elements of maps – Scale, directions, legends, template, etc - Explore various types of Thematic maps.

Studying Area Appreciation: Review literatures, to understand the concept, methods and relevant techniques to appreciate an urban space.

Elements of a city: Understanding various building blocks of a city; Develop understanding about city planning elements using movies, lectures and city tours, etc.

Space Perception: Study of areas with varying characters to appreciate the concepts of built form, activities and people. Appreciate various elements of built form such as plot sizes, FAR, densities, building heights and open spaces; Understanding how built form supports various activities in different areas.

Neighborhood Perception: Mapping of a neighborhood and appreciating the basic characteristics of a neighborhood; Creation of base maps, recording and presenting information on maps, both manually and digitally.

TOTAL : 150 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Able to relate built form, socio-economic pattern, aesthetic and culture of an urban environment.
- CO2** Elucidate the techniques of preparation of base and thematic maps.
- CO3** Conduct appreciation studies on various aspects of the settlement.
- CO4** Able to vision the ideology of studying area appreciation and space by considering stakeholder's needs, issues, potential and priorities.
- CO5** Depict different built environment, scenarios, priorities of development, action areas and elements of a city.
- CO6** Presentation of space perception data on maps, video documentations, models, etc.

TEXT BOOKS

1. Francis D. K. Ching, "Architecture: Form Space and Order", Van Nostrand Reinhold Co, Canada, 1979.
2. Brownill S, "Localism and Neighborhood Planning", Policy Press, Bristol, 2017.
3. Gavin Parker, "Key Concepts in Planning", Sage, New Delhi, 2012.
4. Mary Kane and William M.K.Trochim, "Concept Mapping for Planning and Evaluation", Oxford University Press, 1989.
5. Mona A.Abdelwahab, " A Reflexive Reading of Urban Space", Routledge, 2021.

REFERENCES

1. Christiane Wagner, "Visualizations of Urban Space: Digital Age, Aesthetics, and Politics", Taylor & Francis, Ltd, 2023.
2. Christoph Linder and Shirley Jordan, "Cities Interrupted: Visual Culture and Urban Space", Bloomsbury Academic, 2016.
3. Kevin Lynch, "The Image of the City", M.I.T.Press, 1960.
4. Matthew Carmona, "Public Places Urban Spaces, The Dimensions off Urban Design", Routledge, 2021.
5. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organization, Ministry of Urban Development, New Delhi, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	1	3	2	3	1	1	2	3	3
CO2	3	3	2	2	1	1		1		3	3	3
CO3	3	2	1	1	2	2	1		2	2	2	2
CO4	2	3	2	3	2	3	3	2	2	3	3	3
CO5	3	2	2	2	2	3	2	1	3	3	1	1
CO6	2	1	3	2	2	1	3				2	2
Average	3	2	2	2	2	2	2	1	2	3	2	2

3- High 2-Moderate 1-Low

BN3201

CITIES IN HISTORY

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the historical evolution of cities and its significance to the modern planning.
- To analyze the concepts, stratifications, structure and Institutions of the agrarian, industrial and tribal societies.
- To analyze the history, common and distinct elements, built form and the town planning of the medieval, colonial, modern and post-modern cities/towns of India.
- To remember the typologies, origin, growth, decline and renewal of different Indian cities based on location and function.
- To analyze with case studies, the evolution, trend of growth, urban pattern, historical challenges, and interventions of South Asian cities and compare their similarities and dissimilarities with Asian cities.

UNIT I INTRODUCTION 9

Significance of studying historical processes; Interpreting history for planning purposes; Concept of time as a dimension of built form; Human settlements as a material expression of civilizational development.

UNIT II SETTLEMENTS IN HISTORY 9

Origin of human settlement; Society: concepts and institutions; Social stratification: concept and bases; Agrarian classes; Industry and labor; Tribe: profile and location; Village: structure and change; Forms- caste, class, power & gender.

UNIT III SETTLEMENTS IN HISTORY 9

Cities in India from medieval to colonial era; Medieval planning in India and their common and distinct elements; Colonial history, built form and town planning; Colonialism and the modernist city in India. Modernism and Post-Modernism; Elements of Medieval, Colonial; Modern and Post-Modern Towns.

UNIT IV URBAN PROCESSES 9

Criteria of location and development of towns in Asian history; Political, economic, technological, social and cultural factors shaping settlements through history; Indian city typologies and study of urban growth, decline, renewal in different cities based on functions, locations, etc.

UNIT V HISTORY OF CITIES IN SOUTH ASIA 9

Evolution of cities in South Asia, Urban Patterns and trends, similarities and differences from Indian cities; Historical challenges and interventions in Asian cities; Examples and case studies from South Asia.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Recognize the historical processes for overview of urban settlements and their various urban patterns.
- CO2** Demonstrate familiarity with chronological evolution of different cities and their functional and spatial characteristics in different time periods.
- CO3** Distinguish the various urban processes and different parameters affecting the functioning
- CO4** Relate to a city in terms of its character and pattern.
- CO5** Infer the common elements for categorization of urban patterns based on different parameters.
- CO6** Categorize the locational, developmental, political, economic, technological, social and cultural factors historically shaping the Asian cities.

TEXT BOOKS

1. Lewis Mumford, "The City in History", Harcourt, Brace and World, 1961.
2. Morris A E J, "History of Urban form before the Industrial Revolution", Routledge, 1994.
3. Spiro Kostof. "The city shaped: Urban patterns and Meaning through history", Thames, and Hudson, 1999.
4. Bosselmann, P "Urban Transformation", Island Press, Washington, D.C, 2008.
5. Banga, I. "The City in Indian History", Manohar Publishers and Distributors, New Delhi, 1991.

REFERENCES

1. Beverley, E. "Colonial Urbanism and South Asian Cities", Social History, Vol. 36, No. 4, pp. 482–497, 2011.
2. Introduction to Settlement Geography, Sumita Ghosh, Orient Black Swan , 1998.
3. Cities, Urbanization& Urban Systems (Settlement Systems), K. Siddhartha and S. Mukherjee, Kitab Mahal, 2016.
4. History of Human Settlements, Sengupta, B.K., New Delhi, Institute of Town Planners, India 2002.
5. G. R. Madan, "Social Change and Problems of Development in India", Allied Publisher Pvt. Ltd, 1978.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	3	2	3	3
CO2	3	3	3	3	2	3	2	2	3	2	2	3
CO3	3	2	2	3	3	3	2	2	3	2		3
CO4	3	3	2	2	3	3	2	2	2	2	1	3
CO5	3	2	2	2	2	3	2	2	3	2	2	3
CO6	3	2	2	2	2	3	2	2	3	2	1	3
Average	3	3	2	3	2	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

BN3202

SITE AND LAND DEVELOPMENT

L T P/S C
3 0 0 3

OBJECTIVES

- To formulate a site analyses project with illustrations and report.
- To consider and take into account geological factors to prevent natural disasters and the disaster management strategies.
- To examine Hydrological parameters to identify suitable land for the urban and regional planning.
- To evaluate the physical features of the earth's surface to analyze the land suitability in the urban and regional planning process.

UNIT I SITE ANALYSIS**9**

Definition of plot, site, land and region, units of measurements, reconnaissance and need for surveying. Importance of site analysis; Onsite and off-site factors; Analysis of natural, cultural and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of disposal system, visual aspects; Preparation of site analysis diagram. Site selection criteria for housing development, commercial and institutional projects.

UNIT II GEOLOGY**9**

Geological Structure; Land Forms; Weathering; Landslides and Mass Wasting; Instability of hill slopes. Land and terrain suitability for various types of development. Earthquakes; seismic zoning; disaster prevention and other planning considerations.

UNIT III HYDROLOGY**9**

Ground Water- Concept and role in town planning of different types of terrain, hydrologic cycle; Groundwater bearing properties of different lithological formations; surface water, reservoirs and springs; artificial recharge and ground water mound, hydrological features in relation of seepage; fluctuation of water table and hydrographs; geological structure and underground passages for water supply. Planning considerations for the same. Implications on site selection and development.

UNIT IV FUNDAMENTALS OF GEOMORPHOLOGY**9**

Geomorphic classification and Evolution of landforms; Geomorphic cycle and their interpretation; Evolution of typical geomorphic features of India; Description and classification of folds, faults, joints, unconformities, fault planes; Land form types; Landslides, instability of hill slopes and its prevention.

UNIT V CLIMATE AND HUMAN COMFORT**9**

Factors that determine climate of a place; Components of Climate; Climate classifications; Design Considerations involving Site Conditions; Effective temperature; Human thermal comfort; Use of C.Mahony's tables; Design Of Solar Shading Devices; Building Orientation, Plan form and Building Envelope; Heat transfer and Thermal Performance of Walls and Roofs.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Sensitivity towards aspects of site at macro and micro contexts.
- CO2** Acquire skills required to critically analyze land forms and related literature.
- CO3** Understand the complex social, environmental and cultural challenges that confront land development.
- CO4** Demonstrate knowledge about geological and hydrological aspects of land development.
- CO5** Ability to exploit potential of site to plan the built environment
- CO6** Elucidate the potential/ limitations site offers to plan development considering building orientation, form, and building envelop for the thermal comfort at the micro level.

TEXT BOOKS

1. Kevin Lynch, 'Site Planning', Third Edition, MIT Press, 1984.
2. Edward. T. White, 'Site Analysis', Archi Basic Press, 2014.
3. Beer, A.R. and Higgins, C. "Environment Planning for Site Development: A manual for sustainable local planning and design", Second Edition, E and FN Spon, 2000.
4. Dewberry, S.O. "Land Development Handbook: Planning, Engineering, and Surveying", McGraw Hill, 2008.
5. Warren Viessman and Gary L. Lewis, "Introduction to Hydrology", Pearson Education, 2012.

REFERENCES

1. Syms, P, "Land Development and Design", Wiley, Oxford, 2010.
2. Joseph De. Chiarra and Lee Coppleman, "Urban Planning and Design Criteria", Van Nostrand Reinhold Co., 1982.
3. O.H. Koenigsberger, "Manual of Tropical Housing and Building – Part I - Climate design", Orient Longman, 1993.
4. Richard John Huggett, "Fundamentals of Geomorphology", Routledge, 2011.
5. Genevieve S. Baudoin, "Interpreting Site: Studies in Perception, Representation, and Design", Routledge, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	3	2	1	3
CO2	3	3	3	3	2	3	2	2	3	2	1	3
CO3	3	2	2	3	3	3	2	2	3	2	2	3
CO4	3	3	2	2	1	3	2	2	3	2	1	3
CO5	3	2	2	2	2	3	2	2	2	2	2	3
CO6	3	2	2	2	1	3	2	2	3	2	2	3
Average	3	3	2	3	2	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

BN3203

INTRODUCTION TO MICROECONOMICS

L T P/S C
3 0 0 3

OBJECTIVES

- To remember the definitions of the basic terms of economics and understand their relevance to planning
- To know the laws and the elasticity of demand and supply and their application in urban and regional planning.
- To understand the economic definitions of Perfect and imperfect market types, and economies of scale with reference to urban and regional planning.
- To evaluate and create urban development plan with reference to the housing transportation and land use sectors and the location of socio-economic and infrastructure facilities.
- To create regional plan with reference to the disparities in development, input-output analyses, sectoral development, and the location of socio-economic and infrastructure facilities.

UNIT I INTRODUCTION TO ECONOMICS

6

Definition of economics - Normative Economics Versus Positive Economics- Basics of Micro and Macro Economics- Organisation of Economic activities- theories of economics- Central Problems of An Economy- Use of Economics in Planning..

UNIT II THEORY OF DEMAND AND SUPPLY

12

Definition of need, Demand and supply- Law of Demand and supply- Theory of demand and utility elasticity of demand and supply – its use in Planning- Application of demand and supply in relation to housing and infrastructure services- perfect and imperfect market type – market demand and supply- pricing under different market conditions and the market mechanism, Application of theory in provision of urban services

UNIT III PRODUCTION AND CONSUMPTION **9**
Consumer Choice Theory- Production and Costs- Theory of Production- factors of production, cost scale of production- economics of scale- consumption – theories of consumption – Spatial Case Examples.

UNIT IV FORMS OF COMPETITION **9**
Performance of Competitive Markets- Efficiency, Equity and Welfare Economics- Imperfect Competition: Monopolies, Oligopolies, Monopolistic Competition and an Introduction to Game Theory- Performance and Regulation of Imperfect Markets- Resource allocation and optimization – Spatial Case Examples

UNIT V DEVELOPMENT AND INVESTMENT **9**
Classical and modern approaches- Growth and development indicators- defining development and under development- Economic role of government- Housing and infrastructure investment – Spatial Case Examples

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand and predict how supply and demand concept will affect prices in market economies
- CO2** Interpret, apply and relate economic principles to current economic issues
- CO3** Compute different measures of macroeconomic activity such as the national income accounts, inflation, and unemployment, and evaluate the shortcomings of traditional economic measures.
- CO4** To measure equilibrium level output and measure elasticity of demand
- CO5** Recognize how monetary and fiscal policy can be used to achieve policy goals
- CO6** Recognize market failure and the role of government in dealing with those failures.

TEXT BOOKS

1. Robert H.Frank, : Principles of Micro Economics – Sixth Edition: McGraw: Hill Education, 2016
2. Mankiw, N.G., Kneebone, R.D. and McKenzie, K.J.: Principles of Microeconomics – Sixth Canadian Edition: Nelson Education, 2014.
3. Anne C.Steinemann, William C.Apgar, H.James Brown.: Microeconomics for Public Decisions, Thomson/South-Western, Mason, 2005.
4. Jeffrey M.Perloff Microeconomics, Microeconomics, Pearson Education, Inc, Addison – Wesley – Seventh Edition,2015
5. Karl E.Case, Ray C.Fair, Sharon M.Oster. : Principles of Economics, Pearson Education, 10th Edition, 2014

REFERENCES

1. Duranton, G., Henderson, J.V., and Strange, W.C. (2015) Handbook of Regional and Urban Economics, Volume 5, Elsevier, Amsterdam, 2015
2. Feldman, M.M.A., What Kind of Economics for What Kind of Planning? Journal of the American Planning Association, Vol. 53, Issue 4, pp. 427-429, 1987.
3. Jacobs, J. , The Economy of Cities, Random House, New York,1970.
4. Sandeep Garg , Introductory Microeconomics by Sandeep Garg, Dhanpati Rai Publication, 2021.
5. Campbell McConnell, Stanley L.Brue, Microeconomics: Principles, Problems and Policies, McGraw-Hill/Irwin, 2005.
6. Robert S. Pindyck, Daniel L.Rubinfeld, Microeconomics, Global edition, Published by Pearson, Ninth Edition, 2023.
7. Geoferey A.Jehle, Philip J.Reny, Advanced Microeconomic Theory, Pearson Education Limited, Third Edition, 2011.
8. Dominick Salvatore, Schaum’S Outline of Microeconomics, McGraw Hill, Fourth Edition, 2006.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3				3						
CO2	3											
CO3						3	2	1			3	
CO4		3		2								
CO5	3	3	2		2				1	2	3	2
CO6		3				3		2			1	
Average	2	2	2	2	2	2	2	2	1	2	1	2

3- High 2-Moderate 1-Low

NCC Credit Course Level 1*

NX3251	(ARMY WING) NCC Credit Course Level - I	L	T	P	C
		2	0	0	2
NCC GENERAL					6
NCC 1	Aims, Objectives & Organization of NCC				1
NCC 2	Incentives				2
NCC 3	Duties of NCC Cadet				1
NCC 4	NCC Camps: Types & Conduct				2
NATIONAL INTEGRATION AND AWARENESS					4
NI 1	National Integration: Importance & Necessity				1
NI 2	Factors Affecting National Integration				1
NI 3	Unity in Diversity & Role of NCC in Nation Building				1
NI 4	Threats to National Security				1
PERSONALITY DEVELOPMENT					7
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving				2
PD 2	Communication Skills				3
PD 3	Group Discussion: Stress & Emotions				2
LEADERSHIP					5
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code				3
L 2	Case Studies: Shivaji, Jhasi Ki Rani				2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT					8
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth				3
SS 4	Protection of Children and Women Safety				1
SS 5	Road / Rail Travel Safety				1
SS 6	New Initiatives				2
SS 7	Cyber and Mobile Security Awareness				1
TOTAL: 30 PERIODS					

NCC Credit Course Level 1*

		L	T	P	C
NX3252	(NAVAL WING) NCC Credit Course Level - I	2	0	0	2
NCC GENERAL					6
NCC 1	Aims, Objectives & Organization of NCC				1
NCC 2	Incentives				2
NCC 3	Duties of NCC Cadet				1
NCC 4	NCC Camps: Types & Conduct				2
NATIONAL INTEGRATION AND AWARENESS					4
NI 1	National Integration: Importance & Necessity				1
NI 2	Factors Affecting National Integration				1
NI 3	Unity in Diversity & Role of NCC in Nation Building				1
NI 4	Threats to National Security				1
PERSONALITY DEVELOPMENT					7
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving				2
PD 2	Communication Skills				3
PD 3	Group Discussion: Stress & Emotions				2
LEADERSHIP					5
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code				3
L 2	Case Studies: Shivaji, Jhasi Ki Rani				2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT					8
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth				3
SS 4	Protection of Children and Women Safety				1
SS 5	Road / Rail Travel Safety				1
SS 6	New Initiatives				2
SS 7	Cyber and Mobile Security Awareness				1
TOTAL : 30 PERIODS					

NCC Credit Course Level 1*

		L	T	P	C
NX3253	(AIR FORCE WING) NCC Credit Course Level - I	2	0	0	2
NCC GENERAL					6
NCC 1	Aims, Objectives & Organization of NCC				1
NCC 2	Incentives				2
NCC 3	Duties of NCC Cadet				1
NCC 4	NCC Camps: Types & Conduct				2
NATIONAL INTEGRATION AND AWARENESS					4
NI 1	National Integration: Importance & Necessity				1
NI 2	Factors Affecting National Integration				1
NI 3	Unity in Diversity & Role of NCC in Nation Building				1
NI 4	Threats to National Security				1
PERSONALITY DEVELOPMENT					7
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving				2
PD 2	Communication Skills				3
PD 3	Group Discussion: Stress & Emotions				2

LEADERSHIP		5
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		8
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1
SS 5	Road / Rail Travel Safety	1
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1
TOTAL : 30 PERIODS		

BN3204	TECHNICAL ENGLISH	L	T	P/S	C
		2	0	0	2

OBJECTIVES

- To familiarize first year students of planning with the fundamental aspects of English.
- To develop all the basic language skills - speaking, listening, reading, writing, presenting by giving sufficient practice in real life contexts.
- To enable the students to be competent in writing letters, email, and in vocabulary
- To enable the use of language to think, express analysis and communicate meaning
- To enhance the linguistic and communicative competence of students

UNIT I INTRODUCING ONESELF 6

Listening: Listening and filling a form, listening to speeches by specialists from various branches of engineering and completing activities such as answering questions, identifying the main ideas of the listening text, style of the speaker (tone and tenor) – Speaking: Introducing oneself – introducing friend/ family - Reading: Descriptive passages (from newspapers / magazines)- Writing: Writing a paragraph (native place, school life)- Grammar: Simple present, present continuous – Vocabulary Development: One word substitution.

UNIT II DIALOGUE WRITING 6

Listening: Listening to conversations (asking for and giving directions) –Speaking: making conversation using (asking for directions, making an enquiry), Role plays-dialogues- Reading: Reading a print interview and answering comprehension questions-Writing: Writing a checklist, Dialogue writing- Grammar: Simple past – question formation (Wh- questions, Yes or No questions, Tag questions)- Vocabulary Development: Stress shift, lexical items related to the theme of the given unit.

UNIT III FORMAL LETTER WRITING 6

Listening: Listening to speeches by famous people and identifying the central message of the speech – answering multiple-choice questions)-Speaking: Giving short talks on a given topic Reading: Reading motivational essays on famous planners (answering open ended and closed questions)- Writing: Writing formal letters/ emails (Complaint letters)-Grammar: Future Tense forms of verbs, subject and verb agreement-Vocabulary Development: Collocations – Fixed expressions.

UNIT IV WRITING COMPLAINT LETTERS 6

Listening: Listening to short talks (5 minutes duration and fill a table, gap-filling exercise) note taking/note making- Speaking: Small group discussion, giving recommendations-Reading: Reading problem – solution articles/essays drawn from various sources- Writing: Making recommendations – Writing a letter/ sending an email to the Editor- note making- Grammar: Modals – Phrasal verbs – cause and effect sentences- Vocabulary Development: Connectives, use of cohesive devices in writing, technical vocabulary

UNIT V WRITING DEFINITIONS AND PRODUCT DESCRIPTION**6**

Listening: Listening to a product description (labeling and gap filling) exercises- Speaking: Describing a product and comparing it with other products- Reading: Reading graphical material for comparison (advertisements)-Writing: Writing Definitions (short and long) – compare paragraphs- Grammar: Adjectives – Degrees of comparison - compound nouns- Vocabulary Development: Use of discourse markers – suffixes (adjectival endings).

TOTAL: 30 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Build exposure to basic aspects of Technical English
- CO2** Acquire and exhibit skills in speaking, listening, reading, writing
- CO3** Build skill and confidence in everyday requirements of the English language
- CO4** Able to write formal letters, email, articles etc.
- CO5** Exhibit thorough understanding of Grammar and sound vocabulary
- CO6** Able to express experience, portray through language

TEXT BOOKS

1. Swales, J. M., “Academic writing for graduate students: essential tasks and skills,” 2012
2. Natalie Macris , “Planning in Plain English Writing Tips for Urban and Environmental Planners”, Taylor, and Francis, 2000
3. Revised Edition of “English for Engineers and Technologists” Volume 1 published by Orient Black Swan Limited, 2019.
4. Sharon Hendenreich, “English for Architects and Civil Engineers”, Springer, 2014
5. R.L. Trask, “Language and Linguistics: The Key Concepts”, Routledge, 2007

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1. N. Chomsky, “Reflections on Language”, Fontana, 1975.
2. Steve Pinker, “The Language Instinct”, Penguin, 2015.
3. Chris Mounsey, “Essays and Dissertation”, Oxford University Press, 2005.
4. Sidney Greenbaum, “The Oxford English Grammar”, Oxford University Press, 2005.
5. Krishna Mohan and Meera Banerji, “Developing Communication Skills”, 2nd edition, Laxmi Publications, 2009.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1								3		
CO2	1	1	1	1			1		2	3	1	
CO3	1	1	1	1					2	3		2
CO4							1	2	1	3	2	
CO5	1	1	1	1					1	3	1	
CO6	1	1	1	1	1	1	1	2	2	3	1	2
Average	1	1	1	1	1	1	1	2	2	3	1	2

3- High 2-Moderate 1-Low

BN3211	SURVEYING AND PHOTOGRAMMETRY	L	T	P/S	C
		1	0	4	3

OBJECTIVES

- To remember the definition, classification, the basic principles of surveying
- To understand the basic principles, methods and laboratory exercises of Chain, Compass and Plane Table Surveying.
- To learn the methods of Levelling Surveys through laboratory exercises for the interpolation of contours, calculation earthwork and reservoir capacity.
- To analyse the heights and distances of the objects with theodolite
- To apply the knowledge of cadastral surveying for the description of the various geomorphic features and their implications in the site suitability analyses

UNIT I FUNDAMENTALS OF SURVEYING 15

Definition, Classifications; Plane and Geodetic Surveying; Basic principles; Equipment and accessories for ranging and chaining; Methods of ranging, well-conditioned triangles; Problems in Obstacles; Chain traversing and plotting; Compass; Basic principles, Types; Bearing; System and conversions; Sources of errors and Local attraction; Plane table surveying - accessories and methods; Conventional Symbols; applications. Laboratory Exercises

UNIT II LEVELLING AND CONTOURING 15

Level line Horizontal line; Datum; Bench marks; Levels and staves; temporary and permanent adjustments; Methods of levelling Fly levelling; Check levelling; Procedure in levelling; Booking; Reduction; Curvature and refraction; Reciprocal levelling; Precise levelling; Source of errors; applications. Contouring; Methods; Longitudinal and Cross Section; Plotting, Methods of interpolating Contours; Characteristics and uses of Contours; Areas enclosed by straight lines; Irregular figures; Planimeters; Volumes; Earthwork calculations; Capacity of Reservoirs; Mass Haul Diagrams. Laboratory Exercises

UNIT III THEODOLITE SURVEYING AND COMPUTATIONS 15

Horizontal and vertical angle measurements by Theodolite – Heights and distances– Tacheometric surveying – Trigonometric levelling - Computation of cross sectional areas and volumes - Earthwork calculations - Mass haul diagrams

UNIT IV CADASTRAL SURVEYING 15

History of cadastral survey, Future of Land Records, FMB Sketch Tax; Real Property Legal Cadastral Graphical and Numerical Cadastre, Legal Characteristics of Records, Torrens System. Cadastral map reproduction; Map projection for cadastral maps - Automated Cadastral map; Creation of Land Information System, Integrating LIS; Land Administration, Recent Trends; Map projection for cadastral maps. Laboratory Exercises

UNIT V PHOTOGRAMMETRY 15

Photogrammetry as an Alternative Tool for Surveying; Introduction to Aerial Remote Sensing and Aerial Photographs, Classification; Principles of Stereoscopic Vision; Basic instruments - Stereopair, Pocket and Mirror Stereoscopes, Parallax Bars; Principles of Photogrammetry, Measurement of heights and Depths; Introduction to Digital Photogrammetry; Introduction to GPS; Introduction to Total Stations; Applications in urban and regional planning; Laboratory Exercises

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Introduce the rudiments of various surveying and its principles
- CO2** Imparts concepts of Theodolite Surveying and computation of area and volume calculation
- CO3** Demonstrate skills about the use of remote sensing and photointerpretation for the preparation of land use and land cover maps

CO4 Understand the procedure for finding the heights and distance using theodolite

CO5 Understand the basics of Electronic Surveying and total station.

TEXT BOOKS

1. Lillesand, T., Kiefer, R.W., and Chipman, J. Remote Sensing and Image Interpretation, Wiley, London, 2011.
2. Weilberg M. (ed.) Photogrammetry and Remote Sensing, Syrawood Publishing House, New York, 2016
3. Ralph, M.S., George, W. R. Fundamentals of Information Systems, Cengage Learning, Boston, 2016
4. Herold, M. and Gamba, P. Global Mapping of Human Settlement: Experiences, Datasets, and Prospects, CRC Press, Taylor and Francis, Boca Raton, Florida, 2009
5. Satheesh Gopi Advanced Surveying: Total Station, GIS and Remote Sensing , Pearson, 2007.

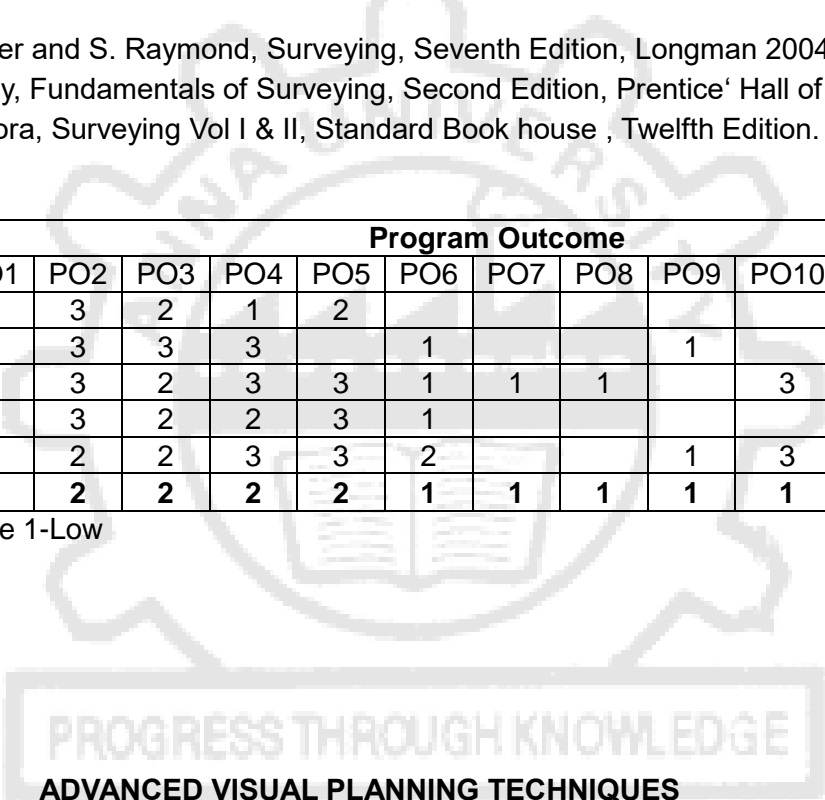
REFERENCES

1. Wilfried Linder Digital Photogrammetry, Springe, 2008
2. R. Subramanian, Surveying and Levelling, Oxford University Press, Second Edition, 2012
3. Bannister and S. Raymond, Surveying, Seventh Edition, Longman 2004
4. S.K. Roy, Fundamentals of Surveying, Second Edition, Prentice' Hall of India 2004
5. K.R. Arora, Surveying Vol I & II, Standard Book house , Twelfth Edition. 2013

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3	2	1	2							
CO2	2	3	3	3		1			1			
CO3	2	3	2	3	3	1	1	1		3	2	
CO4	2	3	2	2	3	1						
CO5	3	2	2	3	3	2			1	3		1
Average	2	2	2	2	2	1	1	1	1	1	2	1

3- High 2-Moderate 1-Low



BN3212

ADVANCED VISUAL PLANNING TECHNIQUES

L T P/S C
1 0 4 3

OBJECTIVES

- To understand the visual hierarchy, text to image relationships.
- To learn the most essential design applications within the creative industry
- To utilize best practices for presenting quantitative data using images.
- To understand and explore the similarities and differences between each application and exactly when to use them in planning projects
- To Identify and demonstrate the steps involved in planning a comprehensive presentation.

UNIT I BASICS OF 3D VISUALIZATION

15

Fundamentals of 3D applications in Urban Planning - Use of SketchUp tools – Creating 3D model in SketchUp - Material Application & Rendering – Animation - Walk through - Lumion program interface - Material Application - Editing Environment and Adding object- Picture & video rendering- Applying in Layout planning.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	3	2	1			2	2		2
CO2	2	2	3	3	3				2	3	2	3
CO3	2	3	3	3	3				2	3	3	2
CO4	2	2	3	2	3	2	1	1	3	3		3
CO5			3	2	3				2	3		3
CO6	2	3	3	3	3				2	3	3	3
Average	2	2	3	3	3	2	1	1	2	3	3	3

3- High 2-Moderate 1-Low

BN3221 PLANNING STUDIO II: VILLAGE STUDY AND DEVELOPMENT **L T P/S C**
0 0 10 5

OBJECTIVES

- To know the historical evolution of a select village and understand its economic, social, spatial and political status of the people by the collection, analyses and interpretation of the appropriate data.
- To understand the hierarchy of the land administrative structure of the villages and evaluate the on-going development schemes of the Local, State, and the Central Governments.
- To propose a re-modelling pattern of rural settlements to improve economic opportunities and social facilities.
- To emphasis on the importance of planning, built form and open spaces that meet the aspirations of the community.
- To formulate a model village development plan using smart technology.

CONTENT

Rural Study:

Elements of Rural space: Understanding the various components associated in the formation of rural spaces.

Space Perception: Rural study would involve an analysis of a rural settlement by comprehending social, economic, physical and political aspects.

Transformation: This exercise would also focus on the understanding of the history of a village and its people, basis of spatial organisation of a village and its transformations over the years.

Influence of Social Structure: The study would also involve understanding of land administration in the village. Study of government schemes for the entire village would be undertaken. Students would be expected to develop sensitivity to development issues in a rural settlement.

Re-Modeling: To propose re-modelling of rural settlement pattern by adopting smart technologies and to improve social facilities.

Rural Development Plan: Rural Development plan for a model village.

OTAL : 150 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Ability to understand the concept of community and settlement evolution and the built environment as influenced by Socio-economic, Cultural, Environmental and Technical factors.
- CO2** Ability to provide a sensitive approach to the design of the built environment taking into account the above-mentioned factors.
- CO3** Conduct surveys of various types.
- CO4** Prepare Development Plan of the Rural area, in consideration of alternative scenarios compatible with the existing status.

CO5 Map the socio-economic and cultural attributes of the rural area.

CO6 Carry out envisioning exercise with the stakeholders.

TEXT BOOKS

1. Sujit Kumar Paul, "Rural Development: Concept and Recent Approaches", Concept Publishing, 2015.
2. S.B.Verma, "Rural Infrastructure", Sarup and Sons, 2008.
3. Komol Singha, "Rural Development in India: Retrospect and Prospect", Concept Publishing Company, 2010.
4. Thomas William and A.J.Christopher, "Rural Development: Concept and Recent Approaches", Rawat Publications, 2015.
5. N.Narayanasamy, "Participatory Rural Appraisal: Principles, Methods and Application", Sage India, 2008.

REFERENCES

1. P.C.Sikligar, "Panchayati Raj & Rural Development: Policy, Practice & Implication", Blue Rose Publisher, 2020.
2. Dr.Anirudh Pandit, "Rural Development: Indian Perspective", Notion Press, 2020.
3. Tiwari KK, "Rural Planning and Development", Dnd Publisher, 2012.
4. Government of India, "Rural Area Development Plans Formulation and Implementation (RADPFI) Guidelines, Ministry of Panchayati Raj, 2021.
5. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	1	3	2	3	1	1	1	2	3
CO2	3	3	2	2	1	1		1	2		3	3
CO3	3	2	1	1	2	2	1		1	2	2	2
CO4	2	3	2	3	2	3	3	2	3	2	3	3
CO5	3	2	2	2	2	3	2	1	2	3	3	1
CO6	2	1	3	2	2	1	3		3			2
Average	3	2	2	2	2	2	2	1	2	2	3	3

3- High 2-Moderate 1-Low

BN3301

PLANNING THEORY

L T P/S C
3 0 0 3

OBJECTIVES

- To introduce planning theory and its critical aspects such as rationality, globalization, modernism, postmodernism, sustainability, participation, implementation and evaluation.
- To expose students to various cities forms.
- To understand the ways through which various forms of cities have taken under variegated societal regimes.
- To evaluate a planning problem and its solution and relate this to planning theory.
- To critically analyze the variety of approaches that have driven and characterized planning activity over time.

UNIT I PLANNING THEORY

9

Understanding the concept of theory in general; Definitions of theory in general; Definitions of planning theory including theory of planning, theory in planning and theory about planning; Significance of planning theory; situating planning- city reform- social reform- governance reform, various issues and their critical evaluation; progressive movement; historical contexts and conditions that gave rise to planning? Definition of paradigm and its various stages of development by Kuhn.

UNIT II RATIONALITY IN PLANNING**9**

Understanding rationality in planning and sustainability in planning; Introduction to categories of rationality and associated paradigms; Theories on rationality – Weber, Philip Johnson & R Brandt, instrumental-Value rationality (means-end rationality) & communicative rationality; rational planning model; criticism of rational planning model - physical planning; systems theory of planning, closed and open systems.

UNIT III TYPES OF PLANNING APPROACHES**9**

Introduction to synoptic, incremental, transactive, advocacy and radical theories of planning; relating SITAR with purpose and process of planning, reasoning and its various forms in planning – space, place and location; perspective planning versus inclusive planning.

UNIT IV THEORIES OF URBAN GROWTH**9**

Classical theories of urban structure – concentric zone theory, sector theory, multiple nuclei theory, etc; compact city approach: concept, advantages and limitations; city beautiful versus city functional; forms of cities in developed and developing world; types of cities - smart cities, compact cities, green cities, vibrant cities; sustainable cities; agglomerations of scale, economies of scale and urban agglomerations; location theories, bid rent theory; cross border regions (CBRs); cities in global south versus cities in the global north.

UNIT V SUSTAINABILITY AND GLOBALIZATION**9**

Sustainable urban development; evolution of the concept, components and processes; weak and strong sustainability; sustainable development goals; millennium development goals; Globalization and components of sustainable urban and regional development; globalization, modernism and postmodernism debate; pragmatism in planning; networked cities.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Summarize some of the core concepts of planning theory.
- CO2** Enumerate the historical and contemporary development in the field of planning theory.
- CO3** Recognize the significance of public participation in urban and regional planning process.
- CO4** Assess the methods involved in Plan evaluation.
- CO5** Distinguish a planning issue within a theoretical frame, through which an approach and its consequences can be deduced.
- CO6** Prioritize competencies to understand planning issues for technically evaluating planning proposals.

TEXT BOOKS

1. Sassen S, "The Global City", Princeton University Press, Princeton, 2001.
2. Cornwall A, "The Participation Reader", Zed Books, London, 2011.
3. Faludi A, "A reader in planning theory", Pergamon press, 1973.
4. Mahadevia Darshini, "Globalization, Urban reforms, & Metropolitan response: India", Manak Publications, New Delhi. 2003.
5. Breheny, M.J. and Hooper, A.J, "Rationality in Planning: Critical Essays on the Role of Rationality in Urban and Regional Planning", Pion, London. 1985

REFERENCES

1. Baer, W.C, "General Plan Evaluation Criteria: An approach to making better plans, Journal of the American Planning Association", Vol. 63, No. 3, pp. 329-344. 1997.
2. Galloway. D. T, "Planning theory in retrospect: The process of paradigm change". Journal of American planning association, 43 (1,) 62-71, 1977.
3. Jacob Torbing and Chris Ansell, "Handbook in Theories of Governance", Edward Elgar Press, London, 2016.
4. Alexander, E.R, "Planning and plan implementation: notes on evaluation criteria", Environment and Planning B: Planning and Design, Vol. 16, pp. 127-140, 1989.
5. Newman, P. and Kenworthy, J, "Sustainability and Cities", Island Press, Washington, D.C. 1999.

COURSE OUTCOMES

Upon the completion of this course, the students would be able to:

- CO1** Apply quantitative and qualitative techniques for planning analysis.
- CO2** Implement tabulation and graphical representation techniques to visually depict data.
- CO3** Analyze and interpret measures of central and measures of dispersion to gain insights into data distributions and variability
- CO4** Apply probability theory, estimation techniques, and hypothesis testing to make statistical inferences
- CO5** Apply the data analysis tools in planning and decision-making processes.
- CO6** Evaluate the appropriateness and effectiveness of different statistical methods and techniques in planning, decision-making, and qualitative data analysis

TEXT BOOKS

- Gelman, A. and Hill, J, 'Data Analysis Using Regression and Multilevel and Hierarchical Models,' Columbia University Press, New York, 2006.
- Molugaram, K. and Rao, G.S, 'Statistical Techniques for Transportation Engineering,' BSP Books Pvt. Ltd. Published by Elsevier, London, 2017
- Kambo, N.S., 'Mathematical Programming Techniques,' Affiliated East-West Press Pvt. Ltd. New Delhi, 2008
- Braun, V. and Clarke, V, 'Successful Qualitative Research: A Practical Guide for Beginners,' Sage, New Delhi, 2013

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- Kothari, C. R., 'Research Methodology – Methods and Techniques,' New Age International, 2004.
- John W Creswell, 'Research design: Qualitative, Quantitative and Mixed Methods Approaches,' Sage Publications; 2011.
- Bruce L. Berg, Howard Lune, 'Qualitative Research Methods for the Social Sciences,' Pearson Publishers, 2011.
- Matthew B. Miles and A. Michael Huberman, 'Qualitative Data Analysis: A Methods Sourcebook,' Sage Publications, 2013
- Ewing, Reid, and Keunhyun Park, 'Basic Quantitative Research Methods for Urban Planners,' New York: Routledge, 2020.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3	3	1			1	3		2
CO2	2	3	3	3	3				1	3	2	3
CO3	2	3	3	3	3				2	3	3	2
CO4	2	2	3	2	3	2	1	1	3	3		3
CO5	3	3	3	2	3				2	3		3
CO6	2	3	3	3	3	2			2	3	3	3
Average	2	3	3	3	3	2	1	1	2	3	3	3

3- High 2-Moderate 1-Low

BN3303

URBAN HOUSING AND PLANNING

L T P/S C
3 0 0 3

OBJECTIVES

- To provide students with an understanding about the nature of housing problems, current issues and aspects in housing.
- To expose students towards housing needs and how housing need is assessed.
- To enable the students in acquiring the skills and knowledge about the characteristics of a community.

- To introduce students to government policies and development regulations.
- To critically examine and understand how affect housing outcomes particularly for the poor.

UNIT I INTRODUCTION 9

Housing: definition, housing as a verb and noun; Housing in relation to planning; Concepts of housing stock, need, demand, shortage; An overview of housing situation; Urban and rural housing scenario in India; Housing as a component of social and economic development; Key challenges of housing provision including housing for the poor, emergence of slums, unauthorised colonies, gentrification, displacement.

UNIT II COMMUNITY AND HOUSING DEVELOPMENT PROCESS 9

Understanding a community, its characteristics, basic entitlements, strengths and weakness; housing tenure, aspects of informal tenure, socio economic implications behind the formation of slums, critical characteristics of slums, sites and services scheme, factors affecting residential location.

UNIT III HOUSING PROJECT FORMULATION 9

Determinants of housing form including physical, social, economic, technical and aesthetic; Development options and housing; Housing costs, standards, densities and FAR; Housing projects and city level housing provisions

UNIT IV CITY LEVEL HOUSING STUDIES 9

Components of housing, housing subsystems; Administrative, legal and financial frameworks for housing development; Processes of housing development; Analysis of housing stress; Concepts of affordability and target identification. Formal and non-formal housing; public and private sector housing development process; inner city housing.

UNIT V POLICY AND LEGISLATIVE FRAMEWORK 9

Evolution of housing policy in India; Components of housing policy at national and state level; Approaches to housing provision for the poor, special groups and other vulnerable groups.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Identify the existing housing situation in a city.
- CO2** Enumerate the socio-economic aspects in housing
- CO3** Examine the national housing policies and other related housing provisions.
- CO4** Infer the relationships between housing markets, housing standards and incomes.
- CO5** Categorize the housing needs for the poor in India.
- CO6** Formulate housing programmes and projects for the poor and their outcomes.

TEXT BOOKS

1. Jain, A.K, "Housing for All", Khanna Book Publishing Co., New Delhi, 2019.
2. Hardoy, J.E. and Satterthwaite, D, "Squatter Citizen: Life in the Urban Third World", Routledge, London, 1989.
3. Verma, G.D, "Slumming India", Penguin, New Delhi 2001
4. Cedric, P, "Housing and Urbanisation: A Study of India", Sage, New Delhi, 1990.
5. Kohli, V.K, "Housing Finance Agencies in India", Deep and Deep, New Delhi, 2007.

REFERENCES

1. Jenkins, P., Smith, H. and Wang, Y.P, "Planning and Housing in the Rapidly Urbanizing World", Routledge, New York. 2007.
2. Mukhija V, "Squatters as Developers, Slum Redevelopment in Mumbai", Ashgate, New York. 2003.
3. Christopher Alexander, 'A Pattern Language', Oxford University Press, New York. 1977.
4. S.K.Sharma, 'Mane A New Initiative in Public Housing', Housing and Urban Development Corporation, 1991.
5. Leuris S, 'Front to Back: A Design Agenda for Urban Housing', Architectural Press, 2006.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	1	1	2	2	3
CO2	3	3	3	2	2	3	1	1		2	2	3
CO3	3	2	2	3	2	3		2	2	2	2	2
CO4	2	3	3	2	2	3	2	2	3	2	2	2
CO5	2	2	3	2	2	3	2	1	2	2	2	3
CO6	2	3	2	3	2	2	1	2	1	1	2	2
Average	3	3	3	3	2	3	1	2	2	2	2	3

3- High 2-Moderate 1-Low

BN3304

ENVIRONMENTAL SCIENCE

L T P/S C
3 0 0 3

OBJECTIVES

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
- To familiarize the influence of societal use of resources on the environment and introduce the legal provisions.
- To inculcate the effect of population dynamics on human and environmental health issues.

UNIT I ENVIRONMENT, ECOSYSTEMS AND NATURAL RESOURCES 9

Environment: Definition, scope and importance of environment, need for public awareness; Ecosystem: Definition, scope and importance of ecosystem, classification, structure and function of an ecosystem, food chains, food web and ecological pyramids, flow of energy; Biogeochemical cycles Hydrological cycle, Phosphorous cycle, Nitrogen cycle. Biomagnifications. Natural resources: Classification of resources, Use and over utilization of surface and ground water, floods and droughts, dams, benefits and problems; Mineral resources: Use and exploitation; Land resources; Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT II BIODIVERSITY, BIOTIC RESOURCES AND ENVIRONMENTAL POLLUTION 9

Biodiversity and biotic resources: Introduction, definition, genetic, species and ecosystem diversity; Value of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and optional values; India as a mega diversity nation; Endangered and Endemic species, Hot spots of biodiversity. Threats to biodiversity: Habitat loss, poaching of wildlife, human-wildlife conflicts; Conservation of biodiversity: In situ and ex-situ conservation; National biodiversity act.

UNIT III ENVIRONMENTAL POLLUTION 9

Environmental pollution: Definition, causes and effects of air pollution, water pollution, soil pollution, noise pollution; Solid waste: Municipal solid waste management, composition and characteristics of e-waste and its management; Pollution control technologies: Waste water treatment methods, primary, secondary and tertiary; Concepts of bioremediation; Global environmental problems: Global Warming, Climate change, Sea level rise, ozone depletion, deforestation and desertification; International conventions / protocols: Earth summit, Kyoto protocol and Montreal protocol.

UNIT IV ENVIRONMENTAL LEGISLATIONS AND SUSTAINABLE DEVELOPMENT 9

Environmental legislations: Environmental protection act, air act1981, water act, forest act. municipal solid waste management and handling rules, biomedical waste management and handling rules2016, hazardous waste management and handling rules, Environmental impact assessment (EIA); Towards sustainable future: Concept of sustainable development, population and its explosion, crazy consumerism, environmental education, urban sprawl, concept of green building.

UNIT V ENVIRONMENTAL APPROACH IN PLANNING**9**

Environmental Concepts – Sustainability and Environmental Carrying Capacity – Environmental Strategies in Landuse, Transportation, Infrastructure Planning and Management - Legislative Requirements, Public Awareness and Community Participation – Environmental Management Option.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Discover knowledge in ecological perspective and value of environment.
- CO2** Distinguish the functions of environment, ecosystems and biodiversity and their conservation.
- CO3** Outline the significance of various natural resources and its management.
- CO4** Identify the causes, effects and environmental pollution and natural disasters and contribute to the preventive measures in the immediate society.
- CO5** Apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
- CO6** Recognize different forms of energy and apply them for suitable applications in for technological advancement and societal development.

TEXT BOOKS

1. Benny Joseph, "Environmental Studies", Tata Mc Graw Hill Publishing Co. Ltd, New Delhi, 1st Edition, 2006.
2. Erach Bharucha, "Textbook of Environmental Studies for Under Graduate Courses", Orient Black Swan, 2nd Edition, 2013.
3. Dr. P. D Sharma, "Ecology and Environment", Rastogi Publications, New Delhi, 12th Edition, 2015.
4. Keith Pezzoli, "Human Settlements and Planning for Ecological Sustainability: The case of Mexico", The MIT Press, 2000.
5. Gilbert M. Masters, Wendell P. Ela, "Introduction to Environmental Engineering and Science, Pearson, 3rd Edition, 2007.

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1. Tyler Miller, Scott Spoolman, "Environmental Science", Cengage Learning, 14th Edition, 2012.
2. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media.
3. Cunningham, W.P. Cooper, T.H. Gorbani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
4. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
5. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. (2013).

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2		3	2	3	1	2	1	3
CO2	3	2	1	1		2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1		1	2	2	1	1	1	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

OBJECTIVES

- To understand the concepts of design thinking approaches
- To conduct design thinking sessions
- To apply both critical thinking and design thinking in parallel to solve problems
- To apply design thinking concepts in urban planning

UNIT I INTRODUCTION TO DESIGN THINKING FRAMEWORK 6

Importance of Design Thinking – Phases in design thinking process – Five stage model – Non-linearity of the five-stage model – Applications of design thinking in Urban planning.

UNIT II UNDERSTAND, OBSERVE AND DEFINE THE PROBLEM 9

Search field determination - Problem clarification - Understanding of the problem - Problem analysis - Reformulation of the problem - Observation Phase - Empathetic design - Tips for observing - Methods for Empathetic Design - Point-of-View Phase - Empathy – Empathize with the users - – Developing empathy towards people – Assuming a beginner’s mindset – Ask What? And Why? – Why-how laddering – Case studies.

UNIT III IDEATION AND PROTOTYPING 9

What is ideation – Need for ideation – Uses of ideation – Ideation Methods – Brainstorming – Rules for brainstorming – Mind maps – Guidelines to create mind maps – Ideation games - Six Thinking Hats – Doodling – Use of doodling in expressing creative ideas; Prototyping – Types of prototyping – Guidelines for prototyping – Story telling – Importance of prototyping in design thinking – Value proposition.

UNIT IV ITERATE AND EVALUATE 9

Need to test – User feedback - Conducting a user test – Kano Model- Desirability Testing - Guidelines for planning a test – How to test - Desirable, feasible and viable solutions – Iterate phase- Agility for Design Thinking

UNIT V CONTEMPORARY URBAN ISSUES IN DESIGN THINKING 12

Case Studies: Citizen Sensing, Participatory and co – design approaches, Design Thinking for Smart City solutions: Bristol citizen sensing approach, Mexico City: Introducing a Bicycle-Sharing Network, design thinking approaches in urban redevelopment, urban design, etc.

TOTAL: 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Understand the importance of design thinking and its different phases.
- CO2** Empathize with user situations and be able to define clear problem statements.
- CO3** Apply different ideation methods and come with different feasible and viable ideas for solving the problem statements.
- CO4** Create prototypes for clear understanding of the problem statement.
- CO5** Evaluate the created prototypes and be able to iterate if the design does not meet the requirement
- CO6** Apply design thinking principles and methodologies to effectively address complex planning challenges

TEXT BOOKS

1. Christian Mueller-Roterberg, “Handbook of Design Thinking - Tips & Tools for how to design thinking,” 2018
2. Jeanne Liedtka and Tim Ogilvie, “Designing for Growth: A Design Thinking Tool Kit for Managers,” Columbia University Press, 2011.
3. Eli Woolery, “Design Thinking Handbook,” Invision, 2019.
4. Rod Judkins, “The Art of Creative Thinking,” Sceptre; 1st edition, 2015

5. Rob Roggema, "Contemporary Urban Design Thinking: The Australian Approach," Germany, Springer International Publishing, 2018.

REFERENCES

1. Johnny Schneider, "Understanding Design Thinking, Lean and Agile", O'Reilly Media, 2017.
2. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press , 2009.
3. Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011
4. Boller, S., Fletcher, L. (n.d.), "Design Thinking for Training and Development,"ATD Press, United States, 2020.
5. Schuldners, Maria,"Co-Creating Smart Cities – Design Thinking for 21st Century Urban Planning," European Research Studies Journal. XXV. 301-315. 10.35808/ersj/2922, 2022.
6. Moncayo-Martínez, Luis A & Ramirez-Nafarrate, Adrian, "Visualization of the Mobility Patterns in the Bike-Sharing Transport Systems in Mexico City" 10.1109/IEEM.2016.7798198, 2016

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3	1	1			1	1	1	2
CO2	2	3	3	3				1		1		3
CO3	2	3	3	3	2					2	2	2
CO4	2	2	3	2	1	2	1	1		2	2	3
CO5	3	3	3	2	3			1	2	2	2	3
CO6	2	3	3	3	3	3			2	3	3	3
Average	2	3	3	3	2	2	1	1	2	2	2	3

3- High 2-Moderate 1-Low

BN3311

SPATIAL DATA INFRASTRUCTURE FOR PLANNING

L T P/S C
1 0 4 3

OBJECTIVES

- To understand the necessity of spatial data in planning.
- To understand the use of Remote sensing in Planning.
- To enable students to use the GIS in solving Spatial Planning problems.
- To study GIS Software Packages and Advanced Concepts of GIS.

UNIT I INTRODUCTION TO SPATIAL DATA AND REMOTE SENSING

15

Spatial Data in Planning, Classification of spatial and non-spatial data, Maps and Spatial Information, limitations of typical DBMS and CAD packages, Introduction to Projection and Coordinate systems, Data base concepts – Primary key, Foreign Key.

UNIT II INTRODUCTIONS TO REMOTE SENSING

15

Definition, components of Remote Sensing, Merits and demerits of data collation between conventional and remote sensing methods, Electromagnetic Spectrum, Types of remote sensing platforms, Classification of satellites, Sun synchronous and Geosynchronous satellites, Lagrange point, Classification of remote sensors, Resolution concept, Orbital and sensor - Remote Sensing Product Availability -characteristics of live Indian earth observation satellites, LIDAR, UAV.

UNIT III INTRODUCTION TO GIS 15

Introduction to Geographic Information Systems and its benefits, types of GIS Software’s, Input and Output Devices; overview of ARC GIS Software, Spatial Data types and creation in GIS, Spatial Information Security and Sharing; Database Structure for GIS, Vector and Raster Data Structures, Comparative Advantages and Disadvantages; Georeferencing of Raster, Digitization of spatial data – Editing spatial data, Attribute Data input and Editing, Creation of Base Maps Thematic Maps and Layout.

UNIT IV SPATIAL ANALYSIS AND GEOPROCESSING 15

Introduction to Geoprocessing and Analyzing geospatial data, Preparation of data for Analysis, Geoprocessing vector data, Spatial analysis tools, Vector Analysis and Raster Analysis, Image Processing.

UNIT V ADVANCED CONCEPTS IN GIS 15

Overlay functions in GIS, using attribute over spatial data in Modeling; case study-based land suitability analysis; Modeling service area for social infrastructures; impact analysis, introduction to Network Analysis.

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Explain the importance and requirement of Spatial Data in Planning.
- CO2** Solve Urban Planning problems using Remote sensing technologies.
- CO3** Analyse the various spatial planning issues using GIS technologies.
- CO4** Examine the required maps and spatial data for different activities related to Planning.
- CO5** Determine the requirement of various tools for spatial decision making.
- CO6** Choose the appropriate spatial tool for specific problem in Urban Planning.

TEXT BOOKS

1. Michael Demers, “Fundamentals of Geographic Information Systems”, John Wiley & Sons Inc; 4th edition, 2008.
2. Anji Reddy. M, “Text book of Remote Sensing and Geographical Information Systems”, B.S. Publications, Hyderabad, 2012.
3. Michael Law and Amy Collins, “Getting to Know ArcGIS Desktop”, ESRI Press, USA, 2022.
4. MD Kennedy, ‘Introducing Geographic Information Systems with ArcGIS - A Workbook Approach to Learning GIS’, John Wiley & Sons Inc; 3rd edition 2013.
5. Paul Longley and Michael Betty, “Spatial Analysis – Modeling in GIS Environment”, John Wiley. 1996.

REFERENCES

1. Michele Campagna, “GIS for Sustainable Development”, Taylor and Francis, 2005.
2. Martin Wegmann , Jakob Schwalb-Willmann , Stefan Dech, “An Introduction to Spatial Data Analysis: Remote Sensing and GIS with Open Source Software”, Pelagic Publishing, 2020.
3. Wilfried Linder, “Digital Photogrammetry”, Springer Publication, 2008.
4. Victor Mesev, “Integration of GIS and Remote Sensing”, John Wiley, ,2007.
5. K.K. Maltiar, S.R. Maltiar, “Concepts of Cartography Remote Sensing and GIS”, Rajesh Publications ,2019.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	-	3	2	-	-	2	2	-	3
CO2	2	2	1	-	3	1	-	-	2	1	1	2
CO3	3	3	2	2	2	2	2	1	1	2	1	3
CO4	1	1	1	-	3	2	-	-	3	2	1	2
CO5	1	1	2	1	3	-	-	-	3	2	-	3
CO6	3	2	3	1	3	1	-	-	2	1	-	3
Average	2	2	2	1	3	1	2	1	2	2	1	3

3- High 2-Moderate 1-Low

OBJECTIVES

- To document a detailed portrait of the neighborhoods, tracing of induced or depending spatial activities, quality of life within them
- To understand the likely impacts of the community based on rigorous spatial, socio-economic and its behavioral pattern.
- To define concrete measures to support desired change and to enhance possible potentials through qualitative and quantitative assessment.
- To experiment innovative participatory methods to achieve the collaborative planning.
- To assist in identifying problems, assets and threats, understanding causal dynamics behind observed patterns and trends, and, thereby address problems or maximize strengths

CONTENT

Perspectives: Enhancing civic engagement and social impact, the studio draws together reflections from the Community Participation in Planning. This course focuses on neighborhood planning and central city revitalization. Community engagement and participation to spatial planning remains challenging, particularly given the diverse range of stakeholders and perspectives that now exist in contemporary society.

Dimensions: It views neighborhood planning as a community driven process that interweaves the physical, ecological, economic and social dimensions of neighborhood and city development into a single fabric, creating livable, sustainable urban environments. This course is particularly concerned with understanding the intersectionality of race, class, gender and the city building process and the ways in which planning aspects mediate socioeconomic inequalities and drive the transformation of underdeveloped communities of the transitional areas or the potential urban centres

Focus: This Planning Studio focuses on community/neighborhood planning in a transitional area. While introducing students to spatial configuration of the environments that integrate the many cultural, spatial, architectural, and ecological issues of these places. This studio aims to further develop skills in conceptualization and visualization through consideration of area specific planning issues.

Interactive Collaboration with locals: It includes documentation and analysis of potential transitional areas, urban form and process, and explores community participation at the greater scale. The students should have an interactive collaboration with the local community to understand their issues, need and requirement.

Analysis and Synthesis: Diagnosis of a neighbourhood's characteristics is designed to assist in identifying problems, assets and threats, understanding causal dynamics behind observed patterns and trends, and, ultimately, generating specific ideas about how to address problems or maximize strengths. The studios shall use of planning techniques tools to identify the issues and requirements of the local community.

Plans, policies and proposals: Development of proposals is to be based on the baseline and detailed analyses outlined above and students should produce individual proposals to the above analysis carried.

TOTAL : 150 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the various aspects of community planning and the importance of participatory approach.
- CO2** Understand that by enabling local residents to create their own vision of their future communities
- CO3** Identify strategies, mechanisms and interventions that help build quality neighbourhoods that are socially and economically diverse.

- CO4** Interpret conceptual understanding of spatial transformation and its relevance with positive development.
- CO5** Apply on the high-end capabilities of illustration, design and documentation of the study area
- CO6** Formulate planning proposals for the study area by evaluating the benefits of participatory planning approach.

TEXT BOOKS

1. Nick Wates, 'The Community Planning Handbook: How people can shape their cities, towns and villages in any part of the world,' 2006.
2. Rhonda Philips, Robert Pittman, 'An Introduction to Community Development,' Routledge, 2nd edition, 2014.
3. R.Mandelker Daniel R.Mandelker, 'Designing Planned Communities,' IUniverse, 2010.
4. Developed by Community Places through the support of the BIG Lottery Fund, Community Planning Toolkit, 2012.

REFERENCES

1. Klosterman R.E, 'Community Analysis and Planning Techniques,' Rowman and Littlefield Publishers, Lanham, Maryland, 1990.
2. Pekmezovic, A., Walker, G. and Walker J, 'Sustainable Development Goals: Harnessing Business to Achieve the SDGs through Finance, Technology and Law Reform,' John Wiley and Sons, New Jersey, 2019
3. Cornwall, A. (ed.), 'The Participatory Reader,' Zed Books, London, 2011.
4. Kochi Municipal Corporation and GIZ, 'Multi-stakeholder Ente Kochi Initiative,' Kochi Municipal Corporation and GIZ India, Kochi, 2019.
5. Kumar, A. and Prakash, P. (eds.) 'Public Participation in Planning in India,' Cambridge Scholars Publishing, Newcastle, 2016.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	1	2	2	1	3	3	2	2
CO2	2	2	1	2	1	1	2	2	3	3	1	2
CO3	2	2	2	3	3	2	3	2	3	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	1	3
CO5	3	3	2	2	2	3	3	3	3	2	3	2
CO6	1	2	3	2	1	2			2	3	2	2
Average	2	2	2	2	2	2	3	2	3	3	2	2

3- High 2-Moderate 1-Low

BN3401

CONTEMPORARY PLANNING THEORY

L T P/S C
3 0 0 3

OBJECTIVES

- To critically examine major theories of planning.
- To expose students towards alternative development theories.
- To equip students to apply theories to contemporary planning practice.
- To understand the significance of human development approach to urban and regional planning in India.
- To gain knowledge about collaborative and communicative planning.

UNIT I SCIENTIFIC RATIONALISM AND PLANNING

9

Defining instrumental rationality; Systems view of planning; Chief characteristics of Comprehensive Rational Planning Model and implications for planning practice; Systematic and systemic change.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	1	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	1	3	3	2	1	3
CO3	3	1	3	3	2	2	2	3	3	1	1	3
CO4	2	3	2	2	3	3	2	3	2	2	1	2
CO5	3	3	3	3	3	3	2	2	2	2	1	3
CO6	3	3	3	3	3	2	3	2	1	2	1	3
Average	3	3	3	3	2	3	2	3	2	2	1	3

3- High 2-Moderate 1-Low

BN3402	URBAN PLANNING AND DEVELOPMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES

- To provide students with a comprehensive understanding of urban planning and development
- To explore the relationships between cities and their regions.
- To familiarize students with various forms, concepts, and emerging theories in urban planning and development
- To equip students with the necessary knowledge and skills in urban planning, development, and management strategies
- To analyze and evaluate the planning and development efforts in major Indian cities

UNIT I INTRODUCTION 9

Introduction to urban, city, metropolis and related concepts, growth and scale. Complexities - social, economic, physical and administrative. urbanization in India - general trends and distribution. Issues and problems in urban planning and development.

UNIT II CITY AND ITS REGION 9

City core vs periphery, Suburbanization, Transit oriented development, Global city and city regions, Area of influence, service area of a metropolis, Metropolitan region and delineation techniques, Metropolitan regional structures: characteristics, components and spatial patterns.

UNIT III FORMS, CONCEPTS AND EMERGING THEORIES 9

Metropolitan centralization and decentralization processes. Concepts of ring and satellite towns, counter-magnets. Forms and concepts for metropolitan planning and development - sheet, galaxy, core, star, ring and multi-nucleated. Their merits and demerits. Efficient functioning of metropolis, New urban theories, Neoliberalism, Behavioral approach and systems approach, Physical, social, economic, environmental, ecological, infrastructural, institutional sub systems; democracy and planning, socialism and planning, fascism and planning, urban renewal and segregation.

UNIT IV URBAN PLANNING, DEVELOPMENT AND MANAGEMENT STRATEGY 9

City/Metropolitan planning - spatial planning studies and surveys. Concepts and techniques of preparation of city plans. Application of management techniques in urban planning and development, Metropolitan planning, development and management strategies at regional and settlement levels. Tools and constraints in the implementation of metropolitan development plan in terms of administration, legal and financial aspects. Role and function of public participation

UNIT V CASE STUDIES**9**

Indian policies and program, collaborative governance in cities, Metropolitan planning, development and management in India. Appraisal of planning and development efforts in case of some of the metropolises, viz. Kolkata, Mumbai, Delhi and Chennai, etc

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Comprehend the knowledge and skills about urban planning and development
- CO2** Analyze and interpret the relationships between cities and their regions
- CO3** Assess the effectiveness of implementation tools and constraints
- CO4** Apply management techniques in urban planning and development scenarios
- CO5** Propose innovative solutions for efficient functioning of metropolises and sustainable urban development
- CO6** Assess and evaluate the planning and development efforts in major Indian metropolises

TEXT BOOKS

1. Patel, S.B., 'Urban Planning by Objectives,' Economic and Political Weekly, Vol. 32, No. 16, pp. 822-826, 1997
2. Krueckeberg, D.A. and Silvers, A.L., Urban Planning Analysis: Methods and Models, Wiley, London, 1974.
3. Baud, I.S.A. and de Wit, J., New Forms of Urban Governance in India: Shifts, models, networks and contestations, Sage, New Delhi, 2008.
4. Evenson, N., Indian Metropolis: A View toward the West, Yale University Press, Yale, 1989.
5. Jenkins, R., Kennedy, L., Mukhopadhyay, P., and Pradhan, K., Special Economic Zones in India: Interrogating the Nexus of Land, Development and Urbanization. Environment and Urbanization Asia, Vol. 6, No. 1, pp. 1–17, 2015.

REFERENCES

1. Baer, W.C., General Plan Evaluation Criteria: An Approach to Making Better Plans, Journal of the American Planning Association, Vol. 63, Issue 3, pp. 329-344, 2007.
2. Mathur, O.P., Urban Finance in 3i Network, India Infrastructure Report, Oxford University Press, New Delhi, 2006.
3. Sethuraman, S.V., Jakarta: Urban Development and Employment, ILO, Geneva, 1976.
4. Ministry of Urban Development, The Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines, Government of India, New Delhi, 2015.
5. Om Prakash Mathur, Impact of globalization on cities and city-related policies in India, Advances in Spatial Science, in: Harry W. Richardson & Chang-Hee Christine Bae (ed.), Globalization and Urban Development, pages 43-58, Springer, 2005.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					3	3					2
CO2	3				1	3	3	1				2
CO3	3	2	1	1	2	3	3	1				2
CO4	3	2	1	2	2	3	3	1				3
CO5	3	2	2	2	2	3	3	1				3
CO6	3	2	2	2	1	3	3	2	2	2	1	3
Average	3	2	2	2	2	3	3	1	2	2	1	3

3- High 2-Moderate 1-Low

OBJECTIVES

- To understand the concept of Infrastructure Planning and Management.
- To educate about the provision of Water Supply, Sanitation and solid waste management.
- To understand the underlying concepts in concept of designing of treatment systems.
- To identify the roles and functions of Infrastructure planning in metropolitan cities.
- To make students capable of planning a suitable physical infrastructure facility for an Area.

UNIT I INTRODUCTION TO BASIC CONCEPTS 9

Infrastructure and its concepts, Role of physical planner in planning of utilities and services, objectives of utilities and services planning and its implications for public health and environmental protection. Introduction to Institutions related to infrastructure services and their standards.

UNIT II WATER SUPPLY SYSTEM 9

Water supply source, treatment system and types, Distribution system and types, Pressure requirements, water requirement for domestic and non-domestic purposes of settlements, firefighting, seasonal variation in demand and factors affecting water demand, standard of water demand percapita, variation of water demand and consumption, requirement of distribution and storage, pipe network analysis. Legal and government policy for urban and rural water supply. Case study discussion on innovative methods.

UNIT III STORM WATER SYSTEMS 9

Estimating storm run-off, Dry Weather Flow, and Storm weather, run-off coefficient, rainfall intensity, time of concentration; Gravity flow, hydraulic gradient line, Manning's formula and nomographs, full flow and partial flow; layout and design of storm water system, General considerations, inlets, self-cleansing velocity non-scoring velocity, physical layout-design principles, data requirement; Rain Water Harvesting.

UNIT IV SANITATION AND SEWER SYSTEMS 9

Methods of sanitations; On-site detention, Off-site and on-site technology up gradation; Low-cost appropriate technologies; standards for Indian cities; Sanitary sewer system network and layout planning, Sewage disposal methods, location criteria and capacity; sewerage Treatment system and technologies, DEWATS, Case study of innovative approaches; financing and cost recovery for sewer system.

UNIT V SOLID WASTE MANAGEMENT 9

Solid waste and types Municipal, solid waste Management Rules, Stages of solid waste management and current practices, Methods of solid waste management, collection, transportation and disposal; Land filling and composting, pre and post treatment, location and cost aspects of different methods of solid waste disposal systems; New methods in solid waste treatment, Community participation and involvement of NGOs in efficient solid waste management, Case study of innovative approaches.

TOTAL: 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Explain about the standards for provision of physical infrastructure facilities.
- CO2** Summarize the existing rules and regulation for provision of physical infrastructure facilities.
- CO3** Outline the various principles, of water supply, sewerage system, storm water drainage and solid waste management.
- CO4** Assess the issues and problem related to provision of facilities like water supply, sewerage system, storm water drainage and solid waste management for a town/city.
- CO5** Able to plan for a water supply, sewerage system, storm water drainage and solid waste management for a town/city.
- CO6** Plan for a water supply, sewerage system, storm water drainage and solid waste management for a town/city.

TEXT BOOKS

1. George Dickens, "Water Supply Management and Urban Planning", Larsen and Keller Education, 2018.
2. Jeremy Colin, Jonathan Parkinson, Kevin Tayler, "Urban Sanitation: A guide to strategic planning" Practical Action Publishing, 2003.
3. W.R. Hudson, R.C.G. Hass, W. Uddin, Infrastructure Management, Mcgraw Hill, 1997.
4. Spiro Pollalis, "Planning Sustainable Cities: An infrastructure-based approach", Routledge; 1st edition, 2016.
5. Rangwala, "Water Supply and Sanitary Engineering", Charotar Publishing House pvt. Ltd, 2022

REFERENCES

1. Larry W. Mays, "Urban Water Supply Handbook", Mc Graw Hill, 2014.
2. Ashok Kumar and D.S. Meshram (eds.), "Future of Cities: Planning, Infrastructure, and Development", Routledge Publication, 2023.
3. James V. Parkin (Author), Deepak Sharma, "Infrastructure Planning", Thomas Telford Ltd, 1999.
4. Michael Humphries QC, "National Infrastructure Planning Handbook 2022", Bloomsbury Professional, 2022.
5. Santosh Kumar Garg, "Environmental Engineering (Vol. I&II)", Khanna Publishers, 1979.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	3	2	3	1	3	3	3	3
CO2	3	2	3	2	1	1	2	-	1	2	2	1
CO3	2	3	2	3	3	1	2	1	2	-	1	2
CO4	3	1	1	3	1	2	3	-	1	3	2	3
CO5	3	3	2	1	2	3	1	2	2	3	1	2
CO6	3	1	1	3	3	2	3	1	2	3	3	3
Average	3	2	2	2	2	2	2	1	2	2	2	2

3- High 2-Moderate 1-Low

BN3404

URBAN GOVERNANCE

L T P/S C
3 0 0 3

OBJECTIVES

- To introduce students to key concepts in, and approaches to, politics in cities, as these have emerged and developed over time.
- To teach students how to analyze and comprehend public policies including planning policies with a particular focus on India.
- To critically understand how seemingly 'marginal', 'radical' or "innocuous" practices provide powerful insights into thinking about alternative policy/political frameworks.
- To develop critical assessment and analytical skills to connect theory to practice to outcomes.
- To analyze critically the politics of planning in India.

UNIT I URBAN POLITICS IN PLANNING

9

Urban inequity, challenging social/spatial inequity, cities of the global south, Political institutions at center, state and local political economy; Politics of the state and bureaucracy; Politics and emergence of civil society; Regeneration and redevelopment politics; Political decision making processes.

UNIT II THE CONCEPT OF GOVERNANCE

9

Evolution of the concept of governance, critical approaches to governance, Types of democracy and significance of decentralization (political, administrative and fiscal); good governance New

institutionalism and networks in governance; New public management, Transparency and accountability, Concept of participatory governance. Political economy of urban governance.

UNIT III LOCAL SELF GOVERNMENT 9

Models of local government, challenges of local government institutions in India; The need and empowerment of local government; Good governance initiatives in local governments; Decentralized planning in India and its various models; participatory planning; participatory budgeting.

UNIT IV GOVERNANCE INNOVATIONS 9

The concept of E-governance, M- governance, SDI governance and their application in disaster management, public service delivery and efficient local governance.

UNIT V URBANIZATION AND MULTI LEVEL GOVERNANCE 9

Multi-level governance: Context, institutional types and critiques; Globalization and Global Governance; Global civil society and global social movement. Rethinking governance through radical practices

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Ability to identify the relationships among society, economy, government and land in the urban context.
- CO2** Appreciate the role of urban politics in policy-making in cities.
- CO3** Formulate an analytical framework in order to discuss the normative ideals of what cities should be.
- CO4** Illustrate comparative policy research and best practices of urban governance.
- CO5** Demonstrate the contexts in which planning emerged as a response to concerns with a range of circumstances over time.
- CO6** Formulate policy solutions to the problems faced in a city.

TEXT BOOKS

1. Aziz, A. & Arnold, D. (eds.) "Decentralized Governance in Asian Countries", Sage, New Delhi. 1996.
2. Chhotry, V. and Stoker, G "Governance Theory and Practice: A cross-disciplinary Approach", Palgrave Macmillan, London. 2009.
3. Carmon, N. and Fainstein, S.S. "Policy, Planning, and People: Promoting Justice in Urban Development", University of Pennsylvania Press, Philadelphia, PA. 2013.
4. Corbridge, S. (ed) "Seeing the State: Governance and Governmentality in India", Cambridge University Press. 2005.
5. Hajer, M. & Wagenaar, H "Deliberative Policy Analysis: Understanding Governance in the Network Society", Cambridge University Press. 2002.

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1. Weinstein L, "One-Man Handed: Fragmented Power and Political Entrepreneurship in Globalizing Mumbai", International Journal of Urban and Regional Research, Vol. 38, No. 1, pp. 14-35, 2013.
2. Storper, M. and Scott, A.J, "Current Debates in Urban Theory: A critical assessment, Urban Studies", Vol. 53, No. 6, pp. 1114–1136, 2016.
3. Fischer, F., Miller, G.J., and Sidney, M.S, "Handbook of Public Policy Analysis: Theory, Politics, and Methods", CRC Press, London, 2006.
4. Moran, M., Rein, M. and Goodin, R.E, "The Oxford Handbook of Public Policy", Oxford University Press, Oxford. 2008.
5. Shatkin, G. (ed.) "Contesting the Indian City: Global Visions and the Politics of the Local", Wiley-Blackwell, Oxford. 2013.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	3	2	3	3
CO2	3	3	3	3	2	3	2	2	3	2	2	3
CO3	3	2	2	3	3	3	2	2	3	2		3
CO4	3	3	2	2	3	3	2	2	2	2	1	3
CO5	3	2	2	2	2	3	2	2	3	2	2	3
CO6	3	2	2	2	2	3	2	2	3	2	1	3
Average	3	3	2	3	2	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

BN3405

TECHNICAL REPORT WRITING

L T P/S C
3 0 0 3

OBJECTIVES

1. To develop effective written and communication skills
2. To enhance reading skills for extracting specific information and understanding the main ideas in various forms of written communication
3. To develop proficiency in English comprehension, paraphrasing, summarizing, and editing for improved written expression.
4. To learn the process of undertaking a literature review, including identifying credible sources, reading and critically analyzing literature, and applying appropriate referencing styles.
5. To understand the elements and format of reports and gain knowledge of indexing and available reference materials for effective report writing.

UNIT I WRITTEN COMMUNICATION

6

Language and communication, differences between speech and writing, distinct features of speech, distinct features of writing, Reading Skills to find out particular information and get the gist through notes, letters, articles, reports. English comprehension, paraphrasing, summarizing and editing.

UNIT II UNDERTAKING LITERATURE REVIEW

12

Identification of credible journals, books, reports, etc.; How to read literature; Styles of referencing such as Harvard Style of Referencing, APA, etc., Understanding an argument, developing your own interpretations What is an argument, validity and strength of arguments, common fallacies of reasoning, use and abuse of language in reasoning

UNIT III ELEMENTS OF REPORTS

6

Type; Types of reports, difference between technical, scientific, legal and other types of communication; specific characteristics of writing technical reports.

UNIT IV FORMAT OF A REPORT

9

Preliminaries: contents, preface, acknowledgements, list of tables and figures; Key words and indexing, Body: introduction, sections and sub-sections, or chapters, conclusions and recommendations; Appendices; References; knowledge of indexing and available reference materials

UNIT V WRITING A REPORT

12

Developing a coherent structure for a term paper and report; Introductory, developmental, transitional and concluding paragraphs, linguistic unity, coherence and cohesion, descriptive, narrative, expository and argumentative writing. Report writing

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Demonstrate knowledge and understanding of the communication skills in speech and writing
- CO2** Comprehend and extract specific information from various written materials.
- CO3** Apply effective reading strategies to identify the main ideas and summarize written information accurately.
- CO4** Evaluate the report's quality and validity, identifying reasoning fallacies and detecting language misuse.
- CO5** Analyze and critically evaluate the credibility and relevance of different sources for conducting a literature review.
- CO6** Synthesize information from multiple sources to develop a coherent and well-structured report

TEXT BOOKS

1. Machi A.L., McEvoy B.T., 'Literature Review: Six Steps to Success,' Corwin (Sage), New Delhi, 2016.
2. Kousoulas, C.A., 'Writing for Planners: Handbook for Students and Professionals in Writing, Editing, and Document Production,' CRC Press, New York, 2019.
3. Macris, N., 'Writing in Planning English: Writing Tips for Urban and Environmental Planners,' Routledge, New York, 2002.
4. John Bowden, 'Writing a Report 9E,' Constable & Robinson Publishers; 9th edition, 2011.
5. Charles Euchner, 'The Elements of Writing,' The New American Press; 4th edition, 2013.

REFERENCES

1. Tracy, Sarah J., 'Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact,' Hoboken: John Wiley & Sons, 2020.
2. Xiao, Yu, and Maria Watson, 'Guidance on conducting a systematic literature review,' Journal of Planning Education and Research 39: 93–112, 2019.
3. Arka Bhattacharya, 'A Handbook of Report Writing,' Books Way Publishers, India, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										3		2
CO2	1				2					3		2
CO3	2			1	1	2		1	1	3		1
CO4	2		1	1	2	3		2	2	3		1
CO5	2	1	1	1	2	2	1	1	2	3		3
CO6	3	2	2	2	1	3	1	2	2	3	1	3
Average	2	2	1	1	2	3	1	2	2	3	1	2

3- High 2-Moderate 1-Low

BN3411

URBAN MOBILITY AND THE CITY

L T P/S C
1 0 4 3

OBJECTIVES

- To learn about the basics of transportation Planning.
- To understand the traffic and travel characteristics of road.
- To understand about mobility and land use and their interaction.
- To learn about the different surveys in transportation planning.
- To study about the different models in transportation Planning.

UNIT I BASICS OF TRANSPORTATION PLANNING

15

Definition, scope and components of transportation planning; Importance of transportation in economic, political and social development; Characteristics and role of various forms of transport -

roadways, railways, waterways and airways; Transport policies and programmes in India before and after independence; Historical perspective of road development in India; Scope and content of 20 year plan road development plans; Current trends in road development; accessibility and priority index in traffic network planning Socio economic significance of transport planning; Cardinal principles of transport planning: economy, efficiency, equity, accessibility, environmental sustainability

UNIT II TRAFFIC AND TRAVEL CHARACTERISTICS 15

Traffic and travel characteristics; Relation of traffic volume, concentration and speed; Traffic as a function of land use; Significance of road user's behaviour and vehicular characteristics; Hierarchy of roads – regional and urban; Geometric design of roads – cross and longitudinal sections and their components; Geometric design standards; Design considerations and guidelines; Capacity and level of service of road, Design of Intersections, At grade intersection, Uncontrolled, Channelization, Rotary, Traffic Signal Control, Signal Co-ordination, Grade Separated Interchanges ,Types , Design and Analysis.

UNIT III UNDERSTANDING MOBILITY AND LAND USE – TRANSPORT INTERACTION 10

Movement vs access; Functions of the street: speed and place; Street pattern and urban form; Accessibility: concept and mapping; Land use and transport interaction; Traffic and transport as a service: public transport, para-transit; Various approaches to parking, Planning for sustainable mobility, the streets of the future, sustainable, cost-effective and feasible solution to mobility issues in cities.

UNIT IV TRANSPORTATION PLANNING SURVEYS 20

Traffic surveys: design of format, sample size; volume count / origin-destination and speed and delay survey; Collation, consolidation, analysis and interpretation of travel data; Parking studies and accident surveys, conduct of field survey and presentation of data and reports.

UNIT V PLANNING AND MANAGEMENT OF TRANSPORT SYSTEM 15

Stages of transport planning process: trip generation, trip distribution, modal split and trip assignment; Types of Land Use Modeling – Lowery & Garin model and Applications –LUT Conception with Dynamic Simulation Modeling - Case Studies. Introduction to public transport; Transit oriented development, NMT, Planning the streets for future.

TOTAL: 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Outline basics of transportation Planning and different transportation polices.
- CO2** Build knowledge about the traffic and Travel characteristics in transportation.
- CO3** Identify the interaction between urban mobility and land use and able to provide sustainable solution for Mobility.
- CO4** Formulate various traffic surveys, analysis and present it various formats.
- CO5** Determine the amount of intervention required in different stages of transportation planning.
- CO6** Develop an interaction between land use and Transportation.

TEXT BOOKS

1. L.R. Kadiyali, "Traffic Engineering and Transport Planning", Khanna Publications, 2010.
2. A K Jain, "Urban Transport: Planning and Management", APH Publications, 2013.
3. Rosário Macário, "Managing Urban Mobility Systems", Emerald, Group Publishing, 2011.
4. Pradip Kumar Sarkar, Vinay Maitri , "G. J. Joshi, Transportation Planning: Principles, Practices And Policies", PHI Learning; 3rd edition, 2021.
5. Ennio Cascetta, "Transportation Systems Engineering: Theory and Methods", Kluwer Academic Publishers, 2001.

REFERENCES

1. John W. Dickey, "Metropolitan Transportation Planning", Taylor and Francis, 1983.
2. Shiftan Y and Glos Edward, "Transportation Planning", Elgar Publishers, 2007.
3. B.G.Hutchinson, "Principles of Urban Transport Systems Planning", McGraw Hill Publications, 1974.

4. Hutton, Barry, "Planning Sustainable Transport", Routledge, Taylor & Francis Books India Pvt Ltd, New Delhi, 2013.
5. C.S. Papacostas & P.D. Prevedouros, "Transportation Engineering and Planning", Prentice-Hall, New York, 2001.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	-	3	2	3	1	2	1	3
CO2	3	2	1	1	-	2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1	-	1	2	2	1	1	1	2
Average	2	2	2	2	1	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

NCC Credit Course Level 2*

NX3451	(ARMY WING) NCC Credit Course Level - II	L T P C
		3 0 0 3
PERSONALITY DEVELOPMENT		9
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		7
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		13
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1
ENVIRONMENTAL AWARENESS & CONSERVATION		3
EA 1	Environmental Awareness and Conservation	3
GENERAL AWARENESS		4
GA 1	General Knowledge	4
ARMED FORCES		6
AF 1	Armed Forces, Army, CAPF, Police	6
ADVENTURE		1
AD 1	Introduction to Adventure Activities	1
BORDER & COASTAL AREAS		2
BCA 1	History, Geography & Topography of Border/Coastal areas	2
TOTAL: 45 PERIODS		

NCC Credit Course Level 2*

NX3452 (NAVAL WING) NCC Credit Course Level - II		L T P C
		3 0 0 3
PERSONALITY DEVELOPMENT		9
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		7
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		13
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1
ENVIRONMENTAL AWARENESS & CONSERVATION		3
EA 1	Environmental Awareness and Conservation	3
GENERAL AWARENESS		4
GA 1	General Knowledge	4
NAVAL ORIENTATION		6
AF 1	Armed Forces and Navy Capsule	3
EEZ 1	EEZ Maritime Security and ICG	3
ADVENTURE		1
AD 1	Introduction to Adventure Activities	1
BORDER & COASTAL AREAS		2
BCA 1	History, Geography & Topography of Border/Coastal areas	2
TOTAL: 45 PERIODS		

NCC Credit Course Level 2*

NX3453 (AIR FORCE WING) NCC Credit Course Level - II		L T P C
		3 0 0 3
PERSONALITY DEVELOPMENT		9
PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3
LEADERSHIP		7
L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
DISASTER MANAGEMENT		13
DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1

ENVIRONMENTAL AWARENESS & CONSERVATION	3
EA 1 Environmental Awareness and Conservation	3
GENERAL AWARENESS	4
GA 1 General Knowledge	4
GENERAL SERVICE KNOWLEDGE	6
GSK 1 Armed Forces & IAF Capsule	2
GSK 2 Modes of Entry in IAF, Civil Aviation	2
GSK 3 Aircrafts - Types, Capabilities & Role	2
ADVENTURE	1
AD 1 Introduction to Adventure Activities	1
BORDER & COASTAL AREAS	2
BCA 1 History, Geography & Topography of Border/Coastal areas	2
TOTAL: 45 PERIODS	

BN3421	PLANNING STUDIO IV : LAND USE AND TRANSPORTATION	L	T	P/S	C
	PLANNING	0	0	10	5

OBJECTIVES

- To understand the interrelationship between transportation and land uses, and related economic, social and environmental issue To understand
- To appreciate the difference between travel demand and transport supply.
- To learn techniques for assessment, mitigation and management of traffic impact of current and proposed development.
- To understand key techniques for management and enhancement of transport supply.
- To promote and make way for sustainable mobility patterns, improve accessibility and promote livability.

CONTENT

Basic surveys: Conduct, analyse, interpret and produce reports on various traffic and transport surveys; road and intersection inventory, traffic volume counts, origin destination, spot speed, speed and delay, parking, pedestrian, public transport surveys, etc
Understand traffic and transportation related problems at the local/subcity level, and develop appropriate plans.

Travel Patterns Study: Analysing the mobility profile of residents and workers within an area, modes used, trip lengths, trip purpose, etc. Origin destination survey includes analysis by comparing travel patterns with socio economic condition, housing typologies and private vehicle ownership. This will also include public opinion on traffic, noise, accessibility and local environment.

Assessment of Travel Demand: Understanding of basic techniques for assessment of traffic impact of existing uses; Surveys and analysis related to traffic generation rates and patterns, parking demand, non-motorized traffic, traffic conditions on surrounding roads and intersections; Basic principles of travel demand modelling could be used to simulate scenarios to test how change in the intensity of use of land could impact traffic in an area.

Transport Supply Analysis: Diagnose the key transportation issues in an area by undertaking studies for analysing traffic volume, journey speed, parking, pedestrian movement and access to public transport. A study about the adequacy of transport infrastructure vis-à-vis travel demand studies undertaken earlier.

Impact of transport on local environment: Analysing noise, emissions, safety and quality of life; Developing indicators; Consideration of the needs of excluded groups such as children, elderly and women; Development of strategies consisting of planning, design and management measures.

TOTAL : 150 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Appreciate urban form and design from the perspective of travel behaviour research.
- CO2** Demonstrate skills and knowledge to prepare traffic and transportation plan. circulation plan or traffic management plan for a human settlement.
- CO3** Elucidate evidence-based approaches to evaluate land use and transportation systems performance.
- CO4** Analyse the impacts of transportation infrastructure on land development and interpret real traffic and transportation problems.
- CO5** Formulate policies aimed to influence the transportation-land use interaction space.
- CO6** Value the ideology of preparation of integrated land use and transportation planning by considering stakeholder's needs, issues, potential and priorities.

TEXTBOOKS

1. Kadiyali L.R, "Transport Engineering", Khanna Book Publishing Co., New Delhi, 2017.
2. Sarkar P.K, Maitri V. and Joshi G, "Transportation Planning: Principles, Practices and Policies", Prentice Hall India, New Delhi, 2014.
3. Verma A and Ramanayya T.V, "Public Transport Planning and Management in Developing Countries", CRC Press, London, 2014.
4. Ryan Gravel, "Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities", St.Martin's Press, 2016.
5. Paramita Majumdar, "Dynamics of Urban Development", Abhijet Publications, 2004.

REFERENCES

1. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.
2. Government of India, "Formulation of GIS Based Master Plan for AMRUT Cities", Town and Country Planning Organisation, Ministry of Housing and Urban Affairs, New Delhi, 2015.
3. Government of India, "Master Plan for Delhi – 2021", Delhi Development Authority, Ministry of Urban Development, New Delhi, 2021.
4. Dr.K.Pratheep Moses, P.Sudharsanamurthy and K.Madhivadhani, "Methodology for the Preparation of GIS Based Master Plan", Tierazliche Praxis, 2021.
5. T.M.Vinod Kumar, "Smart Master Planning for Cities: Case Studies on Digital Innovations", Advances in 21st Century Human Settlements, Springer, 2022.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	2	3	3	2	1	3
CO2	3	3	3	2	3	3	2	3	3	2	1	3
CO3	3	2	2	3	3	2	2	2	3	2	1	3
CO4	2	3	3	3	3	3	3	2	3	2	1	3
CO5	3	2	3	3	2	3	3	3	3	2	1	2
CO6	2	3	2	3	2	2	3	2	3	2	1	2
Average	3	3	3	2	3	3	3	3	3	2	1	3

3- High 2-Moderate 1-Low

OBJECTIVES

- To understand the basic concepts of law and relevant constitutional provisions for urban and regional planning
- To know about the Indian constitution and the legal tools connected with regional planning
- To know about the amendments and its implications in planning laws
- To understand about the laws related to third party legislation
- To analyse about urban and regional planning statutes and legal frameworks for land acquisition and development.

UNIT I CONCEPT OF LAW 9

Sources of law including custom, legislation and precedent, ordinance, bill, act, regulations and byelaws; Significance of law and its relationship to urban and regional planning; Plan Preparation and Modification process, Case laws related to plan preparation, change of land use, implementation and enforcement

UNIT II INDIAN CONSTITUTION 9

Concepts and contents of the Indian Constitution, article 21; Rights and their implications for planning; Fundamental provisions regarding property rights; Overview of legal tools connected with urban and regional planning and development; Model town planning laws.

UNIT III STATUTORY FRAMEWORK FOR PLANNING AND DEVELOPMENT LAW 9

Evolution of town planning legislation, town planning laws, town planning as a state subject; 73rd and 74th amendment and its implications for planning law; Current amendments in planning and development laws; Related laws such as environment and infrastructure laws.

UNIT IV STATUTORY FRAMEWORK FOR LAND ACQUISITION AND ASSEMBLY 9

Laws related to land assembly by public and private parties; Land acquisition legislations, eminent domain, police powers and concept of public purpose; Case studies highlighting nature of contentions, parties in dispute and decisions in specific planning disputes.

UNIT V REAL ESTATE AND OTHER RELATED LAWS FOR DEVELOPMENT 9

Real Estate (Regulation and Development) Act, 2016 and other relevant acts at a particular time, for example, Special Investment Region Act, Community Participation Law

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Acquire knowledge about sources of law and basic terminologies in law.
- CO2** Show knowledge about the implications of relevant articles of the Constitution of India on town planning.
- CO3** Show understanding about the statutory nature of town and country planning.
- CO4** Examine and analyse specific case laws on land, planning and development.
- CO5** Demonstrate knowledge about the role of statutory master plans in translating constitutional provisions.

TEXT BOOKS

1. Lakshimikanth, M., 'Indian Polity,' Tata McGraw Hill, New Delhi, 2007.
2. Bhattacharya, M., 'New Horizons of Public Administration,' Jawahar Publishers and Distributors, Gurgaon, 2001.
3. Needham, B. 'Planning, Law and Economics: An investigation in the rules we make for using land, Routledge,' London, 2006.
4. McAuslan, P. 'Bringing the Law Back In: Essays in Land, Law and Development,' Routledge, London, 2019.

REFERENCES

1. Anindita, M., 'The Legal Right to Housing in India,' Cambridge University Press, Cambridge, 2019.

2. Brand, C., 'Planning Law,' Cavendish Publishing Limited, Singapore, 2001.
3. Jariwala, C.M., 'Environmental Justice: The Directions and Outcome,' Indian Journal of Environmental Law, Vol. 1, pp. 15-30.
4. Ghosh, S. (ed.) 'Indian Environmental Law: Key Concepts and Principles,' Orient Blackswan, Hyderabad, 2019.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1					3		2	2	2		1
CO2		3	3	3	2	1		3		2		
CO3	3	2	3	2	1	2	1				2	
CO4	2	3	2			3					1	
CO5	3	2	2		3					2		2
CO6	2	2	2	1	1	2	1	1	1	1	1	1
Average	1					3		2	2	2		1

3- High 2-Moderate 1-Low

BN3502

INFRASTRUCTURE PLANNING

L T P/S C
3 0 0 3

OBJECTIVES

- To study about social infrastructure requirement.
- To understand the requirement of infrastructure for Rural area.
- To study requirement and Planning issues for Regional Infrastructure.
- To understand the infrastructure development policies at state and central level.
- To study about the different models for provision of infrastructure in an area.

UNIT I PLANNING FOR SOCIAL INFRASTRUCTURE

8

Level and types of social infrastructure- education, health, safety, security, and other public services. Policy context- comparison of existing norms and standards for social infrastructure across states, and national guidelines. Sustainable Development Goals and quality of life. Social infrastructure levels at city and regional level.

UNIT II INFRASTRUCTURE PLANNING FOR RURAL AREA

12

Nature and scope of infrastructure planning for rural area; Issues in providing infrastructure. Policies, Programmes and Schemes; Public distribution system, Water Supply and sanitation, Infrastructure requirements for agriculture, processing, grading, packing, storage and distribution system. Irrigation network and its importance, Infrastructure to promote Forestry, Animal husbandry, Poultry, Fisheries, Piggeries, Sericulture, Beekeeping etc. Infrastructure for energy network to develop rural areas.

UNIT III INFRASTRUCTURE FOR REGIONAL DEVELOPMENT

9

Importance of infrastructure in regional perspective, Integrated infrastructure planning process, regional infrastructure in the context of different level of regions. Norms & Standards. Regional infrastructure constraints, current practices for regional infrastructure development. Planning for infrastructure in a region – Transport, water resources, telecommunication, electricity, energy resources, agriculture market, fertilizer, implements, research and development, extension services. Planning considerations of regional infrastructure, airports, seaports, trade centres, etc.

UNIT IV PLANNING FOR POWER

8

Power, sources of generation, Transmission and distribution, national grid, high tension lines and buffer; gas storage and supply, telecommunication lines, integration of underground infrastructure planning with local circulation planning and design.

UNIT V MODELS OF INFRASTRUCTURE FINANCING**8**

Models of Infrastructure Financing, PPP model for infrastructure financing, BOT, BOOT, BOO, LDOT, BDOT, Problems and Issues emerging in PPP models, LDOT models, Fully Privatized model, Partially privatized models; Urban Infrastructure models in Water Supply, SWM, Sanitation- Case studies in Indian Context.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the required social infrastructure facilities for a town and at regional level.
- CO2** Acquire knowledge about the infrastructure facilities required for the rural area.
- CO3** Able to plan for rural infrastructure facilities required for a rural area based upon their requirements.
- CO4** Understand the requirement of facilities and can plan for regional level infrastructure facilities.
- CO5** Understand the different infrastructure development policies.
- CO6** Study on different financing models available for implementation of infrastructure projects.

TEXT BOOKS

1. A. K. Jain, "Inclusive Planning and Social Infrastructure", Book well Publications, 2010.
2. Bhargaw, G., (2001), "Development of India's Urban, Rural and Regional Planning in 21st Century Policy Perspective", Gyan Publishing House, New Delhi.
3. A. K. Jain, "Inclusive Planning and Social Infrastructure", Bookwell Publications, 2010.
4. S.K. Aggarwal (Ed.), "Regional Development and Planning in India", Concept Publishing Company, 2009.
5. José A. Gómez-Ibáñez and Zhi Liu, "Infrastructure Economics and Policy", Lincoln Institute of Land Policy, 2022.

REFERENCES

1. Eric Klinenberg, "Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life", Crown publication, 2019.
2. Tan Yigitcanlar, "Sustainable Urban and Regional Infrastructure Development: Technologies, Applications and Management (Advances in Environmental Engineering and Green Technologies)", IGI Global, US, 2010.
3. Rajarshi Majumder, "Infrastructure and Development in India: Interlinkages and Policy Issues", Rawat Publications; 2008th edition.
4. Kulwant Singh, Steinberg, Einsiedal, (1996), "Integrated Urban Infrastructure Development in Asia, HUDCO", New Delhi.
5. Kumari. A, "Balanced Regional Development in India; Issues and Policies", New Century Publications, New Delhi, 2006.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	3	-	-	1	3	-	3	-
CO2	3	2	3	2	1	2	1	-	2	-	2	1
CO3	2	3	2	3	3	2	2	-	3	-	2	2
CO4	3	1	1	3	1	2	3	-	1	3	2	3
CO5	3	2	1	2	3	3	1	-	2	2	1	2
CO6	3	2	1	3	3	2	3	1	2	3	3	3
Average	3	2	2	3	2	2	2	1	1	1	2	2

3- High 2-Moderate 1-Low

BN3503	PLANNING AND MANAGEMENT OF INFORMAL SECTOR	L	T	P/S	C
		3	0	0	3

OBJECTIVES

- To understand the dimensions of urban poverty, and analyze the causes and consequences of urban poverty, with a specific focus on slums.
- To examine the theoretical perspectives on poverty alleviation, trace the evolution of poverty alleviation approaches globally and in India
- To comprehend the concept and significance of the informal sector and analyze the socio-economic deprivation associated with the informal sector and its interdependence with formal networks.
- To examine the characteristics of migrants and their impact on the growth of the informal sector and understand the implications of migration for physical planning.
- To evaluate implications of policy framework and planning provisions in addressing informal sector for city planning through case studies from India and other developing countries.

UNIT I URBAN POVERTY 9

Dimensions of urban poverty, measurement of poverty, magnitude of problem; MDGs and SDGs, defining the poverty line, urban versus rural poverty; Causes and consequences of urban poverty, slums; Urban poverty alleviation programmes

UNIT II APPROACHES FOR ALLEVIATION OF URBAN POVERTY 9

Theoretical perspectives on poverty alleviation; Evolution of approach to poverty alleviation in global context and in India; Policies for the urban poor in India since independence; Five year plans and current policy approaches.

UNIT III CONCEPT, CAUSES AND CONSEQUENCES OF INFORMAL SECTOR 9

Concept of informal sector and informality; Types of informal sector and role of informal sector in cities, Spatial focus on informal sector; Socio-economic deprivation and informal sector; Poverty and informality in historic areas; Policies and practices in dealing with the informal sector in India e.g. National Policy on Urban Street Vendors, NCEUS, others; Informal and formal networks and interdependence.

UNIT IV MIGRATORY IMPULSES AND IMPACT ON INFORMAL SECTOR 9

Characteristics of migrants and their association with the growth of the informal sector. Socio-economic deprivation and informal sector. Role of the informal sector in housing stock, economy, commercial activities, etc. Implications in physical planning.

UNIT V PLANNING FOR INFORMAL SECTOR 9

Policy framework for addressing the challenges of informal economy; Planning provisions and norms; Policies governing informal sectors of economy e.g. household industry, street vending, etc. and its implications for city planning. Case studies from India and other developing countries.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Comprehend the dimensions of urban poverty.
- CO2** Understand the causes, consequences, and specific challenges associated with urban poverty, particularly in slum areas.
- CO3** Apply theoretical perspectives on poverty alleviation to analyze and propose effective approaches for addressing urban poverty in India and other regions of the world.
- CO4** Evaluate the policy's role in socio-economic deprivation and practices aimed at managing the informal sector in India.
- CO5** Analyze and integrate the complex dynamics between migration and the growth of the informal sector and propose strategies for integrating the informal sector into physical planning.
- CO6** Evaluate policy framework, analyze sector-specific policies and examine case studies to identify best practices and lessons for informal sector governance.

TEXT BOOKS

1. Agnotti, T., 'Metropolis 2000: Planning, Poverty and Politics, Routledge,' New York, 2018.
2. Breman, J., 'At Work in the Informal Economy of India: A Perspective from the Bottom Up', Oxford University Press, New Delh, 2016.
3. Bromley, R., 'The Urban Informal Sector: Critical Perspectives on Employment and Housing Policies,' Pergamon Press, Oxford, 2013.
4. Mazumdar, D., 'The Urban Informal Sector, World Bank Staff Working Paper No. 43, World Bank, Washington,' D.C, 1976.
5. McFarlane, C. (ed.), 'Urban Informalities: Reflections on the Formal and Informal,' Routledge, New York, 2016.

REFERENCES

1. Nussbaum, M. and Sen, A. (eds.), 'The Quality of Life,' Clarendon Press, Oxford, 1993.
2. Satterthwaite, D. and Mitlin, D., 'Reducing Urban Poverty in the Global South,' Routledge, New York, 2013.
3. Sen, A., 'Development as Freedom,' Alfred A. Knopf, New York, 2000.
4. Sen, K. and Rajesh, R.S.N., 'Out of the Shadows?: The Informal Sector in Post-reform India,' Oxford University Press, New Delhi, 2016.
5. Sethuraman, 'S.V., Jakarta: Urban Development and Employment,' ILO, Geneva, 1976

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2					2	2					2
CO2	2	1		1		3	3	1				2
CO3	2	2	2	2	1	3	3	1				2
CO4	2			1		3	3	1				3
CO5	2	2	2	2	2	3	3	1				3
CO6	2	2	2	2	1	3	3	2	2	2	1	3
Average	2	2	2	2	1	3	3	1	2	2	1	3

3- High 2-Moderate 1-Low

BN3504

PROJECT FORMULATION, APPRAISAL AND MANAGEMENT

L T P/S C
3 0 0 3

OBJECTIVES

- To expose students to techniques of project formulation, appraisal and management.
- To provide inputs to students for learning project evaluation, monitoring and implementation.
- To understand the financial management techniques to monitor and control project.
- To understand the network analysis
- To understand the cost benefit analysis for various regional development projects

UNIT I INTRODUCTION TO PROJECT PLANNING

9

The concept of projects, Importance of project formulation, appraisal and management; reasons for shortfall in its performance; scientific management, lifecycle of project; detailed project report, and feasibility studies; techniques of financial appraisal, payback period, IRR, DCF, NPV, CBR.

UNIT II PROJECT FORMULATION

9

Definition, objectives; Stages of project formulation and their significance; Methodology for project identification and formulation; Feasibility studies, input analysis, financial cost-benefit analysis, social-cost benefit analysis; Project appraisal and report.

UNIT III PROJECT MANAGEMENT 9

Project characteristics; techniques of management, importance of project management; reasons for shortfall in performances; concepts of project organization, contracting, procurement and recruitment budget; fund flow statement and stabilization; organization of project, matrix organization, task forces, project teams; monitor and control project; tools and techniques for project management.

UNIT IV PRE IMPLEMENTATION PLANNING PHASE 9

Work break down structure; Network analysis; CPM PERT; resource levelling and allocation; time cost trade off aspects.

UNIT V PROJECT IMPLEMENTATION, MONITORING AND EVALUATION 9

Project implementation, stages of implementation, Teamwork, actors in project implementation; Project monitoring: meaning objectives and significance; Monitoring techniques: integrated reporting, Milestones, time and cost overrun and under runs, unit index techniques; Project evaluation: meaning, objectives, scope, stages, approach and steps, Life of a project; Techniques of project evaluation: input analysis, financial cost- benefit analysis, social-cost benefit analysis; case studies in urban and regional development projects.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** To show knowledge about evaluating and monitoring of implementation of development projects.
- CO2** To demonstrate skills for the preparation of detailed reports of development projects.
- CO3** Importance and methodology for project formulation and its application.
- CO4** Stages in network analysis and resource allocation.
- CO5** To know about the input analysis, financial cost- benefit analysis, social-cost benefit analysis in regional projects.
- CO6** Technology and techniques involved in private sector participation in infrastructure projects.

TEXT BOOKS

1. Agrawal, R. and Mehra, Y.S., 'Project Appraisal and Management,' Taxmann Publisher, New Delhi, 2017.
2. Mattoo, P.K., 'Project Formulation in Developing Countries,' South Asia Books, New Delhi, 1978.
3. Johansson, P. and Kriström, B., 'Cost-Benefit Analysis for Project Appraisal,' Cambridge University Press, Cambridge, 2016.
4. Gudda, P. A, 'Guide to Project Monitoring and Evaluation,' Author House, Bloomington, Indiana, 2011.

REFERENCES

1. Joy P.K., 'Total Project Management - The Indian Context,' New Delhi, Macmillan India Ltd., 1992.
2. Prasanna Chandra, 'Projects – Planning, Analysis, Selection, Implementation Review,' McGraw Hill Publishing Company Ltd., New Delhi. 2006.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	3	1	2		1			3	1
CO2	2	3	3	3	1	1	2			3		1
CO3	3	1	3		3	2			2	2	3	
CO4	2	3	3		2		2	1			3	1
CO5	2	2			1		3			2	3	
CO6	2	3	1	3	3	2		1		2		
Average	2	3	2	2	2	1	1	1	2	2	3	1

3- High 2-Moderate 1-Low

BN3505

PLANNING POLICIES AND STRATEGIES

L T P/S C
3 0 0 3

OBJECTIVES

- Develop a comprehensive understanding of Policy analysis, prescription, implementation and Evaluation
- Apply Analytical frameworks, methods, and techniques to analyze and solve complex policy problems.
- Assess the role of policy analysis in the policy making process and its impact on policy outcomes
- Identify and address challenges and gaps in policy implementation and propose effective solutions.
- Evaluate the effectiveness and impacts of policies and recommend improvements of policy formulation and implementation.

UNIT I POLICY ANALYSIS

9

Policy Analysis – A Multidisciplinary framework, Four stages of Policy Analysis, The Practice of Policy Analysis, Policy Analysis in the Policy making process, Structuring Policy Problems – Case studies

UNIT II PRESCRIBING PREFERRED POLICIES

9

Prescription of Policy Analysis, Approaches to Prescription, Methods and Techniques for Prescription, Case studies.

UNIT III POLICY IMPLEMENTATION

9

Public policy implementation : Approaches and Models, Interorganizational relations and Public Policy Implementation, Public policy Implementation, Public policy delivery agencies and implementers, Public Policy Implementation – Gaps and Problems, Implementation of Global Policy Agendas.

UNIT IV POLICY EVALUATION

9

Approaches and Techniques, Policy Evaluation: Techniques and Approaches, Roles, process and Criteria, Policy performance, Evaluating Impacts.

UNIT V CASE STUDIES OF POLICIES

9

National Urban Sanitation Policy 2008, The National Urban Housing & Habitat Policy 2007, National Policy for Urban street vendors 2009, National Environmental Policy 2006, National Urban Transport Policy 2014, National water policy 2012.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- Demonstrate a thorough understanding of policy analysis, including the multidisciplinary frame work, stages and practices
- Apply various approaches and techniques for prescribing preferred policies based on rigorous analysis and evaluation.
- Analyze different models and approaches to policy implementation, considering interorganizational relations and global policy agendas.
- Assess the performance and impacts of policies using appropriate evaluation techniques, criteria and processes.
- Apply policy analysis and implementation concepts to real-world case studies, including specific national policies
- Develop critical thinking and problem-solving skills in addressing policy challenges and proposing effective solutions

TEXT BOOKS

1. Sapru R. K. 'Public Policy: Art and Craft of Policy Analysis', PHI Learning Pvt. Ltd-New Delhi, 2011.
2. William N. Dunn 'Public Policy Analysis', Pearson Education, 2015.
3. Urban Policy in Practice, Tim Blackman, Publisher: Routledge, U.K, 1994.
4. Agnihotri .V. K, 'Public Policy, Analysis and Design', Concept Publishing, 1995.
5. Kent E. Portney , 'Approaching Public Policy Analysis: An Introduction to Policy and Programme Research', Prentice Hall-Gale, 1986.

REFERENCES

1. David L. Weimer and Adian R Vining, Policy Analysis: Concepts and Practice, Routledge, Taylor and Francis, 2017
2. Deborah Stone, Policy Paradox – The art of Political decision making, W. W. Norton & Company, 2012
3. Kenneth Hanf and Theo A.J. Toonen, Policy Implementation in Federal and Unitary Systems: Questions of Analysis and Design, Springer, 1985
4. Michael Howlett, Designing Public Policies: Principles and Instruments, Routledge, Taylor and Francis, 2019
5. Peter H. Rossi, Mark W. Lipsey and Howard E. Freeman, Evaluation: A Systematic Approach, SAGE publications, 2003

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	1	3	1	2		1			3	1
CO2	2	3	3	3	1	1	2			3		1
CO3	3	1	3		3	2			2	2	3	
CO4	2	3	3		2		2	1			3	1
CO5	2	2			1		3			2	3	
CO6	2	3	1	3	3	2		1		2		
Average	2	3	2	2	2	1	1	1	2	2	2	1

3- High 2-Moderate 1-Low

BN3521

PLANNING STUDIO V: MASTER PLAN

L T P/S C
0 0 10 5

OBJECTIVES

- Synthesize knowledge and skills obtained in the core courses in planning in order to prepare a plan for an urban settlement.
- Able understand various types and hierarchy of urban Plans, their Characteristics and Contents.

- Elucidate students to prepare a sector integrated comprehensive development plan of a town or a city or a metropolis.
- Able to understand the importance and constraints of process of plan formulation.
- Evolve Development Policies; Land Use Plan, priorities and Implementation mechanism for a selected Urban Area.

CONTENT

Approach: Appreciate the need of master plan in cogitation of city level issues.

Studying development plans: The study shall involve understanding of contents of various types of development plans and explore their foci.

Secondary Source Information for a Selected City or Town: Identification and preparation of secondary source information of the towns or cities selected for the study.

Organization of field surveys: Visit to the case study area, collection of primary and secondary data and information on various aspects such as demography, social, economic, housing, transportation, etc. Conduct of primary and secondary surveys. Interaction with various stakeholders.

Analysis and Synthesis: Analysis and synthesis of data and information collected on various aspects. Projections of population and other related aspects. Trends and issues identification. Development of spatial concepts in consideration of emerging planning concepts.

Plan, policies and proposals: Preparation of Land use plan, policies, proposals and detailed plan document with respect to the identification of priorities and action areas. Phasing and monitoring. Governance structures for implementation.

TOTAL : 150 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- Able to gain the knowledge on approaches adopted in various development plans through case studies and literature reviews.
- Elucidate the delineation of case study area and collection of data on various physical, social and economic aspects.
- To analyze the existing policy and planning literature on urban development plans, and to examine field survey data and information.
- Able to vision the ideology of preparation of comprehensive plan by considering stakeholder's needs, issues, potential and priorities.
- To plan and propose different future scenarios, priorities of development, action areas, phasing and monitoring, and to propose governance structures for the implementation of the plan.
- To produce spatial policies, and to make planning proposals along with a land use plan for a selected urban settlement.

TEXT BOOKS

1. Alexander Garvin, "The Planning Game: Lessons from Great Cities, W.W.Norton & Company, USA, 2013.
2. Shirley Ballaney and Bimal Patel, "Using the Development Plan – Town Planning Scheme, Mechanism to Build Urban Infrastructure, India Infrastructure Report, Oxford University Press, New Delhi, 2009.
3. R.G.Gupta, "Planning and Development of Towns", South Asia Books, 1983.
4. Ryan Gravel, "Where We Want to Live: Reclaiming Infrastructure for a New Generation of Cities", St.Martin's Press, 2016.
5. Paramita Majumdar, "Dynamics of Urban Development", Abhijet Publications, 2004.

REFERENCES

1. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.
2. Government of India, "Formulation of GIS Based Master Plan for AMRUT Cities", Town and Country Planning Organisation, Ministry of Housing and Urban Affairs, New Delhi, 2015.
3. Government of India, "Master Plan for Delhi – 2021", Delhi Development Authority, Ministry of Urban Development, New Delhi, 2021.

- CO3** Stages in the development of ethical behavior in planning project
CO4 Develop the ability to recognize an ethical dilemma.
CO5 Understand the knowledge about the ethical decision making processes.
CO6 Understand the importance of ethics in planning and code of professional conduct

TEXT BOOKS

1. Singer, P. Practical Ethics, Cambridge University Press, Cambridge, 2010.
2. Richards, J.R. The Skeptical Feminist, Routledge, New York, 1980.
3. Harding, C.G. (ed.) Moral Dilemmas and Ethical Reasoning, Routledge, New York, 2017.

REFERENCES

1. Paul, R. and Elder, L. The Thinker’s Guide to Ethical Reasoning: Based on Critical Thinking Concepts and Tools, Foundation of Critical Thinking, Tomales, CA. Second Edition, 2013
2. Barrett, C.D. Everyday Ethics for Practicing Planners, Routledge, New York, 2017.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		2		2		1	1	3			2	
CO2	3	2	1	3	1	3		3		2		1
CO3	3	2	1	2	1		2	2			1	
CO4	2	3	2		1			3		1		
CO5	2	3		2				3				1
CO6	3	1	1					3	3	1	2	1
Average	2	2	1	2	1	1	1	3	1	1	1	1

3- High 2-Moderate 1-Low

BN3602

LAND ECONOMICS AND LAND THEORY

L T P/S C
3 0 0 3

OBJECTIVES

- To develop a comprehensive understanding of the concepts and principles of land economics
- To analyze the economic principles underlying land use and explore the relationship between economic rent, land use, and land values
- To equip students with the knowledge and techniques necessary for land valuation
- To provide an overview of the real estate market, including the laws and regulations governing the sector
- To analyze locational decisions for various land uses

UNIT I INTRODUCTION TO LAND ECONOMICS

9

Economics concepts of land, objectives and scope of land economics; relevance for spatial planning; economic principles of land use; economic rent, land use and land values, demand forecasting, factors affecting land supply and demand market mechanism and land use pattern.

UNIT II LAND PRICING

9

Definition, principles of real estate value concepts, The status of land and property ownership in the Constitution of India, types of land, ownership and various land tenure options. Land valuation techniques, land pricing, subsidies, auctions; type of development, land price index, land Information System (LIS), land records

UNIT III REAL ESTATE MARKET

9

Introduction to various laws related to real estate - Real Estate (Regulation and Development) Act, 2016, Real estate investment and portfolio management, FDI, role of NRIs and PIOs.

UNIT IV FACTORS INFLUENCING LOCATIONAL DECISIONS**9**

Analysis of location of specific uses like residential, industrial, commercial and institutional in the light of location theories in intra-regional and inter-regional context

UNIT V FACTORS INFLUENCING ECONOMIC DECISIONS**9**

Techniques of cost benefit analysis of urban development programme, social costs and benefits, monetization of various costs and benefits, difference between financial and economic analysis.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the concepts, principles, and theories of land economics
- CO2** Interpret and comprehend the economic principles underlying land use
- CO3** Apply their knowledge of land valuation techniques, pricing mechanisms
- CO4** Critically analyze the laws and regulations related to the real estate market
- CO5** Integrate location theories and factors influencing locational decisions to assess and propose optimal land use.
- CO6** Evaluate and assess the economic implications of urban development programs and projects.

TEXT BOOKS

1. Church, R.L. and Murray, 'A.T., Business Site Selection, Location Analysis, and GIS,' Wiley, Hoboken, New Jersey, 2009
2. Evan, A., 'Economics and Land Use Planning,' Wiley-Blackwell, Hoboken, New Jersey, 2004
3. Ryan-Collins, J., Lloyd, T., and Macfarlane, L. 'Rethinking the Economics of Land and Housing,' Zed Books, London, 2017.
4. Harvey, J, 'Urban Land Economics,' Fourth Edition, Macmillan, London, 1996.
5. Isard, W, 'Location and Space–Economy: A General Theory Relating to Industrial Location, Market Areas, Land Use, Trade, and Urban Structure,' MIT Press, Cambridge, 1956.

REFERENCES

1. Nachem, I, 'The Complete Guide to Financing Real Estate Developments,' McGraw-Hill, New York, 2007.
2. Wu, J. and Duke, J.M., 'The Oxford Handbook of Land Economics,' Oxford University Press, New York, 2014.
3. Glatte, T, 'Location Strategies: Methods and their methodological limitations Journal for Engineering, Design and Technology,' Vol. 13, Issue 3, pp. 435 – 462, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	2	2					2
CO2	2	2	2	1	2	2	1	2			1	2
CO3	2	3	3	2	1	2	2	1				2
CO4	2	2	2	2		2	3	2	1			3
CO5	3	3	2	3	3	3	3	2		1		2
CO6	2	3	3	3	2	3	3	3	2			3
Average	2	3	2	2	2	2	2	2	2	1	1	2

3- High 2-Moderate 1-Low

BN3603**BASICS OF URBAN DESIGN**

L	T	P/S	C
3	0	0	3

OBJECTIVES

- To introduce the fundamental concepts and principles of urban design as an interface between architecture and planning.
- To explore the elements that shape urban form, including masses, voids, building typology, scale, harmony, and urban transportation.

- To analyze the physical and non-physical determinants of urban forms and examine case studies of urban design characteristics in different cities.
- To delve into urban studies topics such as urban decay, place-making, heritage, suburban sprawl, and the agencies responsible for urban design.
- To develop an understanding of contemporary urbanism, including current issues, solutions, and best practices in urban design, with a focus on policies and regulations.

UNIT I INTRODUCTION TO URBAN DESIGN 9

Urban design as interface between architecture and planning. City as a three-dimensional entity. Study of volumes and open spaces at all spatial levels. A brief historical review of the development of the urban design discipline and principles.

UNIT II ELEMENTS OF URBAN DESIGN 9

Urban form as determined by inter-play of masses, voids, building typology. Scale, harmony, symmetry, colour, texture, light and shade. Dominance, height, urban signage and graphics. Organization of spaces and their articulation in the form of squares, streets, vistas and focal points. Image of the city and its components such as edges, paths, landmarks, street features, sky-line, etc. Urban transportation.

UNIT III PHYSICAL AND NON-PHYSICAL DETERMINANTS OF URBAN FORMS 9

Activity and the morphology of places. Form, size and structure of cities and the related geometry co-related with their determinants. Case studies of urban design characteristics of cities in India and abroad. Other related issues for public intervention.

UNIT IV URBAN STUDIES 9

Topics include urban decay, change and renewal, place-making, heritage, conservation, identity, suburban sprawl, gated communities, generic form, privatization of public realm. Agencies responsible for ensuring better urban design, their roles, powers and limitations. Tools and methods to include different types of maps/mapping, drawings, sketches, photo documentation, reading, data collection and analysis.

UNIT V CONTEMPORARY URBANISM 9

Understanding aspects, issues and solutions related to urbanism today through the study of literature and best practices/case studies in urban design. Contemporary practices: Townscape policies, building bye-laws and regulations for existing and emerging areas of development. Special rules for heritage and hill areas.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the fundamental concepts, principles, and elements of urban design
- CO2** Comprehend the complexities of urban design as a three-dimensional entity
- CO3** Demonstrate the application of urban design principles by organizing and articulating spaces, and considering the image of the city.
- CO4** Evaluate the impact of physical and non-physical determinants on urban forms, critically examine case studies to identify urban design characteristics
- CO5** Assess the effectiveness of urban design policies, regulations, and interventions, and critically evaluate contemporary urbanism practices
- CO6** Synthesize knowledge skills to propose innovative urban design solutions, to develop sustainable, and functional environments.

TEXT BOOKS

1. A.E.J. Morris, 'History of Urban Form before the Industrial Revolution,' Routledge, 2013.
2. Edmund Bacon, 'Design of Cities,' Penguin, 1976.
3. Gordon Cullen, 'The Concise Townscape,' The Architectural Press, 1978.
4. Michelle Provoost et al., 'Dutchtown, NAI Publishers,' Rotterdam, 1999.
5. Donald Natson, 'Time Saver Standards for Urban Design,' McGraw Hill, 2017.
6. Kevin Lynch, 'The Image of the City,' MIT Press, 1960.

REFERENCES

- Jonathan Barnett, 'An Introduction to Urban Design,' Harper Row, 1982.
- Lawrence Halprin, 'Cities,' MIT Press, 1972.
- Gosling and Maitland, 'Concepts of Urban Design,' St. Martin's Press, 1984.
- Malcolm Moor, 'Urban Design Futures,' Routledge, 2006.
- Geoffrey Broadbent, 'Emerging Concepts in Urban Space Design,' Taylor and Francis, 2003

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	2	2					2
CO2	2	3	3	3	2	1	2					2
CO3	2	3	3	3	1	2	2					2
CO4	2	2	3	2		2	2	1	1	2	1	3
CO5	3	3	3	2		2	2	2				2
CO6	2	3	3	3	1	3	3	1	2			3
Average	2	3	3	2	1	2	2	1	2	2	1	2

3- High 2-Moderate 1-Low

NCC Credit Course Level 3*

NX3651

(ARMY WING) NCC Credit Course - III

L T P C
3 0 0 3

PERSONALITY DEVELOPMENT

9

PD 3 Group Discussion: Team Work

2

PD 4 Career Counselling, SSB Procedure & Interview Skills

3

PD 5 Public Speaking

4

BORDER & COASTAL AREAS

4

BCA 2 Security Setup and Border/Coastal management in the area

2

BCA 3 Security Challenges & Role of cadets in Border management

2

ARMED FORCES

3

AF 2 Modes of Entry to Army, CAPF, Police

3

COMMUNICATION

3

C 1 Introduction to Communication & Latest Trends

3

INFANTRY

3

INF 1 Organisation of Infantry Battalion & its weapons

3

MILITARY HISTORY

23

MH 1 Biographies of Renowned Generals

4

MH 2 War Heroes - PVC Awardees

4

MH 3 Study of Battles - Indo Pak War 1965, 1971 & Kargil

9

MH 4 War Movies

6

TOTAL: 45 PERIODS

NCC Credit Course Level 3*

NX3652 (NAVAL WING) NCC Credit Course - III		L T P C
		3 0 0 3
PERSONALITY DEVELOPMENT		9
PD 3	Group Discussion: Team Work	2
PD 4	Career Counselling, SSB Procedure & Interview Skills	3
PD 5	Public Speaking	4
BORDER & COASTAL AREAS		4
BCA 2	Security Setup and Border/Coastal management in the area	2
BCA 3	Security Challenges & Role of cadets in Border management	2
NAVAL ORIENTATION		6
NO 3	Modes of Entry - IN, ICG, Merchant Navy	3
AF 2	Naval Expeditions & Campaigns	3
NAVAL COMMUNICATION		2
NC 1	Introduction to Naval Communications	1
NC 2	Semaphore	1
NAVIGATION		2
N 1	Navigation of Ship - Basic Requirements	1
N 2	Chart Work	1
SEAMANSHIP		15
MH 1	Introduction to Anchor Work	2
MH 2	Rigging Capsule	6
MH 3	Boatwork - Parts of Boat	2
MH 4	Boat Pulling Instructions	2
MH 5	Whaler Sailing Instructions	3
FIRE FIGHTING FLOODING & DAMAGE CONTROL		4
FFDC 1	Fire Fighting	2
FFDC 2	Damage Control	2
SHIP MODELLING		3
SM	Ship Modelling Capsule	3
TOTAL : 45 PERIODS		

NCC Credit Course Level 3*

NX3653 (AIR FORCE WING) NCC Credit Course Level - III		L T P C
		3 0 0 3
PERSONALITY DEVELOPMENT		9
PD 3	Group Discussion: Team Work	2
PD 4	Career Counselling, SSB Procedure & Interview Skills	3
PD 5	Public Speaking	4
BORDER & COASTAL AREAS		4
BCA 2	Security Setup and Border/Coastal management in the area	2
BCA 3	Security Challenges & Role of cadets in Border management	2

AIRMANSHIP		1
A 1	Airmanship	1
BASIC FLIGHT INSTRUMENTS		3
FI 1	Basic Flight Instruments	3
AERO MODELLING		3
AM 1	Aero Modelling Capsule	3
GENERAL SERVICE KNOWLEDGE		2
GSK 4	Latest Trends & Acquisitions	2
AIR CAMPAIGNS		6
AC 1	Air Campaigns	6
PRINCIPLES OF FLIGHT		6
PF 1	Principles of Flight	3
PF 2	Forces acting on Aircraft	3
NAVIGATION		5
NM 1	Navigation	2
NM 2	Introduction to Met and Atmosphere	3
AERO ENGINES		6
E 1	Introduction and types of Aero Engine	3
E 2	Aircraft Controls	3
TOTAL : 45 PERIODS		

BN3621	PLANNING STUDIO VI: SUB-CITY PLAN	L	T	P/S	C
		0	0	10	5

OBJECTIVES

- Able to study plan preparation and its relationship of higher order plan with lower order plans such as Master Plan with Zonal Plan and Detailed Development Plan.
- Develop the lower order plan within the framework of Master Plan.
- Able to details out land allocations and planning proposals given in statutory plans at the inner part of cities.
- Help students to see interrelations amongst different sectors at the sub-city level.
- Understand the practical reality of land allocation and management policies.

CONTENT

Approach to Plan Making: Introduce different approaches to plan making with a focus on local or sub-city level planning and to apprise the comprehensive development plan, structure plans, zonal plans and sector plans with an intension to understand its local implications.

Secondary Source Information for a Selected City or Town: Identification and preparation of secondary source information of the lowest planning level of a city.

Organization of field surveys: Conduct, analyze and interpret findings of detailed primary surveys on different aspects of built form – land use and utilization, building footprints, floor-wise land utilization, building and population density, infrastructure needs, etc. Conduct key informant interviews, stakeholder mapping and profiling, case study interviews and questionnaire-based surveys to develop detailed local development covering all spatial and socio-economic aspects of development.

Analysis and Synthesis: Analysis and synthesis of data and information collected on various aspects. Projections of population and other related aspects. Trends and issues identification.

Plan, policies and proposals: Sub-City level plan to be prepared on aspects of land and building use, local development regulations, planning standards, building bye-laws, local circulation and transportation aspects, land economic base, local environmental conditions, conservation and urban design, and other aspects deemed contextually relevant.

TOTAL : 150 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Appreciate the rationale for planning at local area level.
- CO2** Outline the development of the relevant planning standards for different land uses.
- CO3** Identify major socio – economic, physical, environmental and regulatory issues pertinent to revitalize local area.
- CO4** Value the ideology of preparation of sub-city plan by considering stakeholder’s needs, issues, potential and priorities.
- CO5** Examine the various context specific aspects and to create various development options.
- CO6** Develop spatial guidelines and development regulations to outline the planning strategies adopted for plan implementation.

TEXT BOOKS

1. Dutsche Gesellschaft fur International Zusammenarbeit, “Land Use Planning: Concepts, Tools and Application”, Ministry for Economic Cooperation and Development, Germany, 2012.
2. Rishi Dev, “Local Area Planning in India”, Copal publishing, 2015.
3. Narendra Patel, “Town Planning Scheme: A tool for making planning work for city development”, Indra Stra Global, 2019.
4. Patrick Geddes, “Town Planning Towards City Development”, Vista Publishing, 2016.
5. Carl Patton, David Sawicki and Jennifer Clark, “Basic Methods of Policy Analysis and Planning”, 2012.

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1. Government of India, “Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organization, Ministry of Urban Development, New Delhi, 2015.
2. Government of India, “Managing Urban Growth using the Town Planning Schemes in Andhra Pradesh”, Centre for Good Governance, Ministry of Urban Development, TCPO, Hyderabad. 2010.
3. Government of India, “Report of the Working Group on Urban Strategic Planning, Steering Committee on Urban Development and Management, Ministry of Housing and Urban Poverty Alleviation, New Delhi, 2011.
4. Government of Gujarat, “Manual for Preparation of Local Area Plans”, Gujarat Real Estate Regulatory Authority, 2022.
5. New Delhi Municipal Council, “Sub-city Development Plan of Delhi for New Delhi Municipal Council Area”, IL&FS Ecosmart Limited, New Delhi 2007.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	1	1	2	2	1	3	3	1	2
CO2	2	2	1	2	1	1	1	2	3	3	1	1
CO3	2	1	2	3	3	2	3	2	3	3	2	3
CO4	3	3	2	3	2	2	3	2	3	3	1	3
CO5	3	3	2	2	2	3	3	3	3	2	3	2
CO6	1	2	3	2	1	1			2	3	2	2
Average	2	2	2	2	2	2	2	2	3	3	2	2

3- High 2-Moderate 1-Low

OBJECTIVES

- To understand the concept of a region and its significance in spatial planning
- To familiarize the students with various regional planning models and techniques used to analyze and design regional development strategies.
- To examine the patterns and processes of settlement distribution within a region, considering factors such as population density, land use, infrastructure, and accessibility.
- To gain insights into the processes involved in regional development, including economic growth, infrastructure development, environmental considerations, and social aspects.
- To critically analyze regional planning policies and their impacts on sustainable development, social equity, and environmental conservation.
- To apply regional planning principles and techniques, evaluating their effectiveness in addressing real-world regional development challenges with the help of case studies.

UNIT I REGION AND TYPES OF REGIONS 9

Defining a region, types of regions; Delineation of regions; Metropolitan region, structure of a metropolitan region, area of influence and dominance, shadow regions; Trickle down effects; Rural-urban fringe, its structure, growth and implications.

UNIT II SPATIAL DISTRIBUTION OF SETTLEMENTS 9

Settlement in regional; context; spatial models of location, size and spacing of settlements; Central Place Theory; Characteristic of rural – urban fringe; rural– urban continuum; inter – urban inequalities; Regional interaction: Rank Size Rule, Settlement patterns and analysis; Loschian theory; Regional networks.; Gravity model, classification of settlements; Delineation of Regions, institutional scalogram.

UNIT III REGIONAL DEVELOPMENT 9

Regional development; Balanced and unbalanced development; Underdevelopment; Regional multiplier, input-output model; Cumulative causation theory; Core-periphery model; Growth poles and centers; Regional planning projects such as corridor development, road development projects, port development projects, airports and metro rail projects, etc.

UNIT IV PLANNING PROCESSES 9

Regional planning processes: Identification of plan objectives; collection, classification and analysis of data; Norms and standards for regional planning; Formulation of alternative plan proposals with respect to population distribution, location of new regional economic activities, infrastructure, plan implementation, etc

UNIT V CASE STUDIES 9

Selected case studies in regional development - Rajasthan canal area, South- East resource region, Western ghats region, etc. District planning. Metropolitan regions - National capital region, Mumbai metropolitan region, international case studies.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Comprehend different types of regions, regional planning models, and techniques.
- CO2** Understand the need for planning at various levels, with a specific focus on regional planning.
- CO3** Analyze the spatial distribution of settlements and understand the nature of regional development processes.
- CO4** Familiarize with the contents, approach, and methodology of preparing Regional Plans.
- CO5** Evaluate and assess the effectiveness of regional development processes.
- CO6** Synthesize information from case studies and apply it to real-world regional planning scenarios.

TEXT BOOKS

1. Glasson, J., 'An Introduction to Regional Planning: Concepts, Theory and Practice, University of California,' Berkeley, 1978.
2. Mishra, R.P., Sundaram, K.V. and Prakasa Rao, 'V.L.S., Regional Development Planning in India: A New Strategy,' Rawat, Jaipur, 1974.
3. Misra, R.P., 'Regional Development Planning in India: A New Strategy, Vikas Publishing House,' New Delhi, 1978.
4. Plane, D.A., Mann, L.D., Button, K. and Nijkamp, P., 'Regional Planning, Edward Elgar Publishing, Cheltenham,' 2007.
5. Routra, J.K., 'Urban and regional planning in practice in India,' Habitat International, Vol. 17, Issue 3, pp. 55-74, 1993.

REFERENCES

1. Glasson, J. and Marshall, T, 'Regional Planning,' Routledge, London, 2007.
2. Appiah-Opoku, S., 'Urban and Regional Planning in Barney Warf' (ed.) Encyclopedia of Geography, Sage, London. Six Volumes, 2010.
3. Calthorpe, P. and Fulton, W., 'The Regional City: Planning for the End of Sprawl,' Island Press, Washington, D.C, 2001.
4. McLoughlin, J.B., 'Urban and Regional Planning: A Systems Approach,' Faber and Faber, London, 1969

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					3	3					2
CO2	3				1	3	3	1				2
CO3	3	2	1	1	2	3	3	1				2
CO4	3	2	1	1	1	3	3	1				3
CO5	3	2	2	2	2	3	3	1				3
CO6	3	2	2	2	1	3	3	2	2	2	1	3
Average	3	2	2	2	1	3	3	1	2	2	1	3

3- High 2-Moderate 1-Low

BN3702

PROGRESS THROUGH KNOWLEDGE
URBAN FINANCE

L T P/S C
3 0 0 3

OBJECTIVES

- To understand about the powers and resource of local government
- To analyse about the source of financing and urban reforms
- To understand about pooled finance development fund
- To understand about the property tax reforms a monetization of public properties
- To analyse about the process of financial management system for urban area
- To understand about public private partnership

UNIT I MUNICIPAL FINANCE

9

Principles and composition of income and expenditure of urban local bodies; Taxation and user charges; Intergovernmental fiscal relations; Powers and resources of local governments; Constitutional provisions; CFC and SFC, Index of decentralization; Limitations and need for revenue enhancement; Expenditure Control methods and mechanisms; Assistance from foreign donors and Mutli National agencies.

UNIT II ALTERNATIVE SOURCES OF FINANCING 9

Types of Partnership approaches, Privatization of civic services, types of contracts and ownerships; user charges projects; Pricing of services; Market Access; Municipal Bonds; Pooled finance; Land Value Capture; Land Extractions.

UNIT III RESOURCE BASED ON ACHIEVEMENT OF URBAN REFORMS 9

Role of state government and urban local bodies; City's challenge fund Urban reforms, Implications on resources, incentive fund and state level; Pooled finance development fund; property tax reforms and monetization of public properties.

UNIT IV INSTITUTIONAL CAPACITY ENHANCEMENT 9

Finance management, management process; Accounting and budgeting, asset management, receivables management; Computerization as a tool for resource enhancement; Role of Management Information Systems.

UNIT V INFORMATION SYSTEM 9

Financial operating plan, city corporate plan; Development of urban indicators; infrastructure pricing and financing - Financing mechanisms in addition to tax and grants; Private public partnerships like BOT, BOOT, BOLT etc.; Impact fee, subsidies and betterment fees.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the income and expenditure of local bodies.
- CO2** Analyse about the assistance and requirements of donors from multinational agencies.
- CO3** Analyse about the source of financing from different approaches.
- CO4** Understand about the role of urban local bodies in facing the challenges in urban reforms
- CO5** Understand about the financing mechanism

TEXT BOOKS

1. Biekpe, N., Cassimon, D. and Mullineux, A. (eds.) 'Development Finance and its Innovations for Sustainable Growth,' Palgrave Macmillan, New York, 2017.
2. Mathur, O.P. 'Impact of Globalization on Cities and City-Related Policies in India', in H. Richardson, W. Harry, and C. Chang-Hee (eds.) Globalization and Urban Development (pp. 43-58), Springer, Berlin, 2005.
3. Mathur, O.P. 'Urban Finance', in 3i Network, India Infrastructure Report, Oxford University Press, New Delhi, 2006.
4. Mathur, O.P., Thakur, D., and Rajadhyaksha, N. (2009) Urban Property Tax Potential in India, National Institute of Public Finance and Policy, New Delhi.

REFERENCES

1. Mathur, O.P. 'The Financing of Urban Infrastructure Issues and Challenges, Background Note,' Ministry of Finance, Government of India, New Delhi, 2018.
2. Mishra, A.K. and Mohanty, 'P.K., Urban infrastructure financing in India: applying the benefit and earmarking principles of taxation,' Journal of Social and Economic Development, DOI: [10.1007/s40847-018-0059-1](https://doi.org/10.1007/s40847-018-0059-1), 2018.
3. Mohanty, P.K., 'Financing Cities: Municipal reforms, fiscal accountability and urban infrastructure,' Sage, New Delhi, 2016.
4. Peterson, G.J., 'Financing Cities: Fiscal responsibility and urban infrastructure in Brazil, China, India and South Africa,' Sage, New Delhi, 2007.
5. Singh, K. and Ta'I, B. (eds.) 'Financing and Pricing of Urban Infrastructure,' New Age Books Publishers (P) Ltd, New Delhi, 2000.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3		2		3	3	2	1	1	3	
CO2	3	3	1	3	1	1	1	3		1	3	

TEXT BOOKS

1. Amitabh Kundu and Varghese.K, "Regional Inequality and Inclusive Growth in India under Globalization", Institute of Human Development, 2010.
2. Kulshrestha, "Urban and Regional Planning in India: Handbook for Professional Practice", S.K.Sage Publications, 2012.
3. Roy.A and OngA, "Worlding Cities: Asian Experiments and the Art of being Global", Wiley Blackwell,London, 2011.
4. Walter Isard, "Methods of Regional Analysis: An Introduction to Regional Science", MIT Press, Cambridge, 1960.
5. David A.Plane, "Regional Planning", Cheltenham Edward Elgar, 2008.

REFERENCES

1. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.
2. Government of Gujarat, "Manual for Preparation of Development Plans", Gujarat Real Estate Regulatory Authority, 2022.
3. Government of India, "Manual for Preparation of Town and Regional Planning Maps", Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 1972.
4. Government of Tamil Nadu, "Regional Plan (Preparation, Publication and Sanction) Rule", Directorate of Town and Country Planning, 2021.
5. Government of Maharashtra, "Standardized development control and promotion regulations for Regional Plans in Maharashtra", Urban Development Department, 2013.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	3	2	1	3	2	1	1	2	3
CO2	2	2	3	2	1	1	2	1	2	2	2	2
CO3	3	1	2	3	2	1	3	2	1	1	1	3
CO4	3	2	3	2	3	2	2	2	2	3	2	2
CO5	3	1	2	3	2	1	3	2	1	1	2	3
CO6	2	2	1	2	3	2	3	1	3	2	1	2
Average	3	2	2	3	2	1	3	2	2	2	2	3

3- High 2-Moderate 1-Low

BN3722

DISSERTATION

L T P/S C
0 0 6 3

OBJECTIVES

- To develop knowledge and skills in identifying appropriate literature for a given topic of research /study, draw inferences and understanding from a wide range of literature.
- To explore different tools and techniques and qualitative and quantitative analysis that are acquired in the context of the study undertaken.
- To engage in logical dialogues and discourses based on past research.
- To acquire report writing skills, Report structuring and Chapterisation.
- To promote research in urban and regional planning.

CONTENT

To introduce the students on research methods and to develop competencies for critically examining a topic of their interest and present it credibly before the faculty. This is also a preparatory stage for the students to get enough knowledge and skills for carrying out a thesis project of their choice. Furthermore, this course will help them to have general ideas about their

topic for undertaking thesis project and develop research questions, structure, research strategy and present critical analysis of existing literature.

TOTAL : 90 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Identification of topic of interest having relevance to planning profession, Establishing a need for research in the chosen domain.
- CO2** Develop knowledge about how to systematically organize ideas for a particular research topic
- CO3** Articulate responses to various authors, books and papers and move from argument to argument in a succinct and logical way to identify a research gap.
- CO4** Select a research design and appropriate tools & techniques for data analysis.
- CO5** Identification of study area and significance.
- CO6** Report structuring and Chapterisation.

TEXT BOOKS

1. Healey, P. and Silva, E., 'The Routledge Handbook of Planning Research Methods,' Routledge, New York, 2015
2. Ward, K., 'Researching the City: A Guide for Students,' Sage, New York, 2020
3. Choy, L. T., "The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches". IOSR Journal of Humanities And Social Science, 2014.
4. Igwenagu, C, "Fundamentals of research methodology and data collection" Vol.1, Nsukka: University of Nigeria, 2016.
5. Coughian, M., Cronin, P. and Ryan, F, "Step by-step guide to critiquing research. Part 1: quantitative research". Dublin: School of Nursing and Midwifery. Trinity School, 2007.

REFERENCES

1. Janes Ouma Odongo and Donghui Ma, "Perspective in Urban Planning Research: Methods and Tools", Scientific Research, academic publisher, 2021.
2. Diana MacCallum, Courtney Babb and Carey Curtis, "Doing Research in Urban and Regional Planning: Lessons in Practical Methods", Routledge, 2019.
3. Sturat Farthing, "Research Design in Urban Planning: A Student's Guide, SAGE Publications Ltd, 2016.
4. Reid Ewing and Keunhyun Park, "Basic Quantitative Research Methods for Urban Planners", Taylor & Francis, 2020.
5. Ranjit Kumar, "Research Methodology: A Step-by-Step Guide for Beginners", Sage: 2014.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	2	2	2	2	3
CO3	3	3	3	3	3	2	2	2	1	1	1	1
CO4	3	3	1	2	3	1	1	2	3			2
CO5	2	2	3	2	2	2	2	3		2		1
CO6	2	1	3	3	3	3	2	2			2	2
Average	3	3	3	3	3	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

OBJECTIVES

- Help the students to have direct understanding of the practice of planning profession.
- Able to formally and informally interact with the Officials engaged in planning to enhance employability of the students.
- To enable the acquisition of in-depth knowledge in a specific aspect/ issue in the discipline of planning as well as develop perspectives on the same through reading, study, analysis and thought.
- Enable interacting with practicing Planners, allied professionals, researchers and organizations working in the field of specialty in planning.
- Provide students the opportunity to test their interest in a particular career before permanent commitments are made.

CONTENT

The students shall undertake the Internship training, in an Organization engaged in activities relating to Planning for a period of 4 weeks. The internship training will provide the necessary acumen and knowledge to the students to become employable by any Planning Organization.

The Internship is also expected to make familiar the internship demands and complexities of planning. The students may also utilize the internship training to strengthen the quality of their thesis works. The students are expected to complete the internship training before the commencement of the seventh semester and enroll for the same in the seventh semester.

The work undertaken during this training shall be presented by the students in the training seminar before the faculty. The students shall submit an internship Training Report and shall be evaluated on the basis of the Report submitted through a Viva-Voce Examination, as part of the End Semester Examinations of the Seventh semester.

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Express the basic knowledge of named social sciences and relationship of this knowledge with the core ideas of urban and regional planning.
- CO2** Exposure in and enrichment with respect to specific areas of planning for pursuing practice or independent research.
- CO3** Able to determine the challenges and future potential for his / her internship organization in particular and the sector in general.
- CO4** Able to test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
- CO5** Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization.
- CO6** Analyze the functioning of internship organization and recommend changes for improvement in processes.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	1	-	3	2	3	1	3	1	3
CO2	3	3	2	3	3	2	2	3	3	3	2	3
CO3	1	3	1	3	3	2	1	2	2	2	2	1
CO4	3	3	2	3	3	2	2	3	3	3	2	3
CO5	3	3	1	3	3	2	1	2	2	2	2	1
CO6	2	2	2	2	2	1	2	3	3	2	1	3
Average	3	3	2	3	3	2	2	3	3	3	2	3

3- High 2-Moderate 1-Low

OBJECTIVES

- Develop the knowledge and skills to carry out independently the identification of development issues through a well laid out methodology.
- Enhance the design/research abilities and apply the knowledge gained, skills developed and professionalism
- Develop the knowledge in Select a research design and appropriate tools & techniques for data analysis
- Propose rational solutions towards sustainable development of the urban and rural settlements.
- Develop the knowledge and skills to carry out independently the identification of development issues through a well laid out methodology.

CONTENT

Building on the subject of 'Dissertation', the main objective of 'Thesis' is to teach students about how to conduct research systematically, starting with making a choice of a research topic through the literature review, field work, analysis of field data, synthesis of literature and field work findings, drawing conclusions and making recommendations.

Each student is required to prepare a thesis on a subject concerning urban, rural or regional planning and development. Each research topic would be approved by the faculty and finalized through discussions within the department. Thesis will provide an opportunity to the student to synthesize knowledge and skills acquired by him/her through learning of various theories and practices during the last three and half year. The students will be required to present their work orally, graphically and through written report. The student will also be required to present his/her thesis before the external jury appointed by the school. The thesis shall be monitored continuously and periodically through internal marked reviews to check the consistency of work, the relevance of the analysis with respect to the data collected and project scope, and the progress towards logical proposals

TOTAL : 300 PERIODS**COURSE OUTCOMES**

Upon the completion of this course, the students would be able to:

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Create coherent key take aways on various books and papers, proceeding logically to the thesis topic.
- CO2** Ability to understand sectoral and spatial issues emerging as a consequence to development and scientifically analyze the planning issues.
- CO3** Apply solutions appreciating the principles of planning in a democratically acceptable and a justifiable manner.
- CO4** Conduct data analysis and analyze scenarios related to development.
- CO5** Formulate development related proposals or solutions.
- CO6** Able to write and present a Research Proposal.

TEXT BOOKS

1. Murray, Rowena, "How to Write A Thesis, Open University Press", McGraw Hill Education, UK, 2011.
2. Tayie, Sami, "Research Methods and Writing Research Proposals", Pathways to Higher Education, Cairo, 2005.
3. Choy, L. T., "The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches". IOSR Journal of Humanities And Social Science, 2014.
4. Igwenagu, C, "Fundamentals of research methodology and data collection" Vol.1, Nsukka: University of Nigeria, 2016.
5. Coughian, M., Cronin, P. and Ryan, F, "Step by-step guide to critiquing research. Part 1: quantitative research". Dublin: School of Nursing and Midwifery. Trinity School, 2007.

REFERENCES

1. Janes Ouma Odongo and Donghui Ma, "Perspective in Urban Planning Research: Methods and Tools", Scientific Research, academic publisher, 2021.
2. Diana MacCallum, Courtney Babb and Carey Curtis, "Doing Research in Urban and Regional Planning: Lessons in Practical Methods", Routledge, 2019.
3. Sturat Farthing, "Research Design in Urban Planning: A Student's Guide, SAGE Publications Ltd, 2016.
4. Reid Ewing and Keunhyun Park, "Basic Quantitative Research Methods for Urban Planners", Taylor & Francis, 2020.
5. Ranjit Kumar, "Research Methodology: A Step-by-Step Guide for Beginners", Sage: 2014.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	3	2	1	3	2	1	1	2	3
CO2	2	2	3	2	1	1	2	1	2	2	2	2
CO3	3	1	2	3	2	1	3	2	1	3	1	3
CO4	3	2	3	2	3	2	2	2	2	3	2	2
CO5	3	1	2	3	2	1	3	2	1	1	3	3
CO6	2	2	1	2	3	2	3	1	3	3	1	2
Average	3	2	2	3	2	1	3	2	1	3	2	3

3- High 2-Moderate 1-Low

PROFESSIONAL ELECTIVE COURSES

BN3001

STREET PLACES AND ACTIVE TRANSPORT

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the standards of street infrastructure for the pedestrian
- To understand the level of active transport and the neighbourhood design
- To evaluate the safety aspect of the pedestrians
- To understand the guideline for the pedestrian
- To understand the techniques and requirements for modelling active transport

UNIT I STREET INFRASTRUCTURE

9

Street design – street elements - pedestrian prioritised street – healthy and safe communities – pedestrian networks – road infrastructure for pedestrians.

UNIT II ACTIVE TRANSPORT AND ITS INFRASTRUCTURE

9

Levels of active transport - Built Environment and Neighborhood Effects on Travel Behaviour - Active Transportation and Health - Active Transport Infrastructure and Public Transport Provision – access to service

UNIT III ACTIVE TRANSPORT AND SAFETY

9

Active transport and road safety – road safety and urban form – walking and pedestrianisation – Cycling – policies and program – facilities and infrastructure - The Effect of Personal Characteristics on Travel Behaviour

UNIT IV GUIDELINES FOR PEDESTRIAN FACILITIES

9

Public transport planning and operation – bus and train transit modes – transit system performance – integrating active and public transit issues and opportunities.

UNIT V LEGAL ASPECT**9**

Pedestrian modelling techniques – road network and pedestrian flow – crowd management – indicators to measure congestion – guidelines and tools for pedestrian facilities

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the street infrastructure required for the safe and healthy movement of the pedestrian.
- CO2** Relation of neighbourhood design with the active transport.
- CO3** Policies and guideline for the active transport.
- CO4** Infrastructure facilities required for the active transport.
- CO5** The Effect of Personal Characteristics on Travel Behaviour of the people
- CO6** Modelling techniques to design the pedestrian flow and crowd management

TEXT BOOKS

1. Geetam Tiwari, Dinesh Mohan, 'Transport and Safety Systems, Approaches, and Implementation, Springer transactions in civil and environmental Engineering,' India, 2021.
2. Michael Szell, Sayat Mimar, Tyler Perlman, 'Gourab Ghoshal & Roberta Sinatra Growing urban bicycle networks,' Scientific reports, 2022
3. Colin G Pooley, 'Promoting Walking and Cycling: New Perspectives on Sustainable Travel,' Policy Press, 2013
4. Geetam Tiwari, Dinesh Mohan, 'Transport and Safety Systems, Approaches, and Implementation,' Springer transactions in civil and environmental Engineering, India, 2021.

REFERENCES

1. IRC 103 – 2012 Guidelines for pedestrian facilities
2. Claudio Feliciani, Kenichiro Shimura, Katsuhiko, Ishinari, 'Introduction to Crowd management: Managing Crowds in the Digital Era: Theory and Practice,' Springer Nature Switzerland AG, 2023.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2					3				2	1
CO2	3	2				2	3				3	
CO3	3	2	2	2			3	1		1	3	
CO4	3	3	3	3	2	3	3		2			
CO5	3	2	1	2		3	2					1
CO6	3	3	2	3	3			2	1	1	3	
Average	3	2	1	2	1	1	2	1	1	1	2	1

3- High 2-Moderate 1-Low

BN3002 CLIMATE RESILIENT SETTLEMENT PLANNING

L T P/S C
3 0 0 3

OBJECTIVES

- To introduce the basic concepts of climate change mitigation, adaptation and resilience.
- To facilitate about the implications of climate change in settlement planning.
- To familiarize with the emerging opportunities in climate change mitigation and adaptation.
- To inculcate the idea of planning for climate resilient cities by examining various emerging theoretical frameworks as well as field experience.
- To create awareness about policies and guidelines related to climate change mitigation and adaptation.

UNIT I UNDERSTANDING CLIMATE CHANGE

9

Basics of Climate Change, Ozone depletion, Factors affecting climate change, Changing perspectives of Climate change, Impacts of climate change, Vulnerability, Urban Heat Island effect, Flooding, International and National Efforts: United Nations Framework Convention on Climate Change (UNFCCC), Conference of Parties, Kyoto Protocol, Intergovernmental Panel on Climate Change (IPCC), National Communication Process, National Action Plan on Climate Change (NAPCC), Indian Network of Climate Change Assessment, Global Environment Facility (GEF), Clean Development Mechanism (CDM); International guidelines; Global, national and state policies on climate change.

UNIT II MITIGATION STRATEGIES AND LOW CARBON DEVELOPMENT

9

Urbanization and Climate change - human settlements as major contributors to GHGs, Sectoral emissions; Carbon footprint; Mechanisms and measures for mitigating climate change, Carbon credits, trading and other alternatives; Low Carbon Settlements, Planning interventions for low carbon development through case studies – Integrated land use and transportation planning; Compact city form, Transit oriented development, Sustainable transport, Energy efficient approaches, Waste management; Best practices, Mitigation strategies at various levels through case studies.

UNIT III ADAPTATION STRATEGIES AND CLIMATE CHANGE RESILIENCE

9

Migration as adaptation, Importance of adaptation in preparing and coping with climate change; Ways to adapt to climate change - Early warning systems. Ecosystem restoration, Climate-resilient infrastructure, urban water management system - supply and security, Long-term planning; Capacity development; Best practices, Adaptation strategies at various levels through case studies.

UNIT IV SOCIO-ECOLOGICAL RESILIENCE TO CLIMATE CHANGE

9

Socio-ecological resilience discourse, Nature and society through the lens of resilience - Nature based solutions, Eco system approach, Green cities; Assessing climate change stress through field exploration, Ways of building resilience to climate change stress; Energy efficient city planning; Best practices, Climate change resilient settlements for urban poor, coastal cities through case studies.

UNIT V BUILDING CLIMATE CHANGE RESILIENCE

9

Future and smart cities, Urban climate governance and participatory action planning - Locally led planning strategies, Precautionary principle and climate change; Institutional preparedness; Integrating climate change policy and action plan in various levels of development plans, Operationalization of Climate Resilience – Policy level, planning level and Implementation level. Action plan and resilience plan for state, region and urban area; Emerging tools and techniques in climate studies. Best practices.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Elucidate the impact of climate change and specific vulnerabilities related to it.
- CO2** Appreciate planning with respect to adaptation, mitigation and resilience associated with climate change.
- CO3** Illustrate emerging opportunities in climate change mitigation and adaptation.
- CO4** Enumerate climate change mitigation through sustainable urban solutions.
- CO5** Elucidate the idea of socio ecological resilience to climate change and examine ways of assessing climate change stress.
- CO6** Associate sustainability in a holistic manner, incorporating past knowledge and current developments in the field.

TEXT BOOKS

1. Bicknell, David Dodman and David Satterthwaite, “Adapting Cities to Climate Change: Understanding and Addressing the Development Challenges”, Earthscan, US, 2009.

- David Crichton, Fergus Nicol, Sue Roaf, 'Adapting Buildings and Cities for Climate Change', Taylor and Francis, 2016.
- Tony Clayton, Nicholas J. Radcliffe, Anthony M. H. Clayton, 'Sustainability: A Systems Approach', Routledge, 2018.
- Stephen M. Wheeler, 'Climate Change and Social Ecology: A New Perspective on the Climate Challenge', Routledge, New York, 2012.
- Tri HarsoKaryono, Robert Vale, Brenda Vale, 'Sustainable Building and Built Environments to Mitigate Climate Change in the Tropics-Conceptual and Practical Approaches', Springer, 2017.

REFERENCES

- R.K.Pachauri, 'Dealing with Climate Change: Setting a global agenda for mitigation and adaptation', The Energy and Resources Institute(TERI), 2010.
- Daniel D. Perimutter, 'The Challenge of Climate change: Which way now?', John Wiley & sons Ltd., 2010.
- Colin A. Booth, Felix N. Hammond, David G. Proverbs, Jessica Lamond, 'Solutions for Climate Change Challenges in the Built Environment', John Wiley & Sons, 2011.
- Madan Kumar Jha, 'Natural and Anthropogenic Disasters: Vulnerability, Preparedness and Mitigation', Springer, 2016.
- Sethi, M. "Climate Change and Urban Settlements: A Spatial Perspective of Carbon Footprint and Beyond", Routledge, Oxon, 2017.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	1	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	1	3	3	2	1	3
CO3	3	1	3	3	2	2	2	3	3	1	1	3
CO4	2	3	2	2	3	3	2	3	2	2	1	2
CO5	3	3	3	3	3	3	2	2	2	2	1	3
CO6	3	3	3	3	3	2	3	2	1	2	1	3
Average	3	3	3	3	2	3	2	3	2	2	1	3

3- High 2-Moderate 1-Low

BN3003 ADVANCED SPATIAL DATA INFRASTRUCTURE FOR PLANNING **L T P/S C**
1 0 4 3

OBJECTIVES

- To expose the students to advanced techniques in GIS
- To educate students in Phyton language.
- To impart the skill of customization using Phyton in GIS.
- To educate students in R programming.
- To enable the students to do spatial analysis using R Programming.

UNIT I MODEL BUILDER AND ARC TOOLBOX **15**

Introduction to Arc Scene, 3D Spatial Analyst Tool, Introduction to model builder, Types of Model builder, creating a new tool box for a work flow. Mobile Mapping and data integration. Flood stimulation mapping.

UNIT II INTRODUCTION TO PYTHON **15**

Scripting, Introduction to Python, Numbers and operators, Variables and Data types, Expressions, Decisions and Loops, Modules, File Access, loading Vector & Raster layers, List, Dictionaries, Simple Functions, Simple Graphics, Image Processing, Design of Simple GUI,

Instance Variables, functions for vector to raster conversion, georeferencing raster layer, creating a hill shade map.

UNIT III OBJECT ORIENTATION IN PYTHON 15

Objects and Classes, Data-Modeling, Building a New Data structure, Inheritance and Polymorphism, Data Encryption, Threads and Processes, Search Algorithms, Basic Sort Algorithms. Setting up a Python editor, Geoprocessing using Python, Arcpy Package, Debugging and error handling

UNIT IV R PROGRAMMING BASICS 15

Introduction, Data types, Variables, Vectors, Scalars, Conclusion, Data Frames, Lists, Matrices, Arrays, Classes, Arithmetic and Boolean Operators and values, Structures, Control Statements, Loops, Recursion, Scoping Rules, Loop functions, Array and Matrices, Spatial programming

UNIT V DATA MANIPULATION AND DATA VISUALISATION 15

Functions, Math Functions, Linear Algebra Operation, Probability Distributions: Normal, Binomial, Poisson, Graphics, Creating Graphs, Customizing Graphs, Box plot, Histogram, Pie graph, Line chart, Scatterplot, Spatial Attribute Analysis

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Develop 3d visualisation and stimulation using GIS software.
- CO2** construct required tools using model builder
- CO3** Explain the use of phyton programming and its functions in analysis of issues.
- CO4** Solve urban Planning problems by customizing the work flow using phyton Scripts.
- CO5** Explain the use of R programming and its functions in simplifying the data visulaization.
- CO6** Develop spatial analysis tools using R and Phyton Programming.

TEXT BOOKS

1. David W. Allen, "Getting to Know ArcGIS Model Builder", Esri Press; 1st edition 2011.
2. Paul A. Zandbergen, "Python Scripting for ArcGIS Pro", Esri Press, 2nd ed. Edition, 2020.
3. Silas Toms , Bill Parker, Dr. Christopher Tucker, Rene Rubalcava, "Python for ArcGIS Pro: Automate cartography and data analysis using ArcPy, ArcGIS API for Python, Notebooks, and pandas", Packt Publishing Limited, 2022.
4. Chris Brunsdon, Lex Comber, "An Introduction to R for Spatial Analysis and Mapping (Spatial Analytics and GIS)", SAGE Publications Ltd; Second edition, 2018.
5. Robin Lovelace, Jakub Nowosad, Jannes Muenchow, "Geocomputation with R", Chapman & Hall/CRC The R Series, 2019.

REFERENCES

1. Paul A. Zandbergen, "Advanced Python Scripting for ArcGIS Pro", Esri Press; 1st edition,2020.
2. Tripp Corbin GISP, "Learning ArcGIS Pro 2: A beginner's guide to creating 2D and 3D maps and editing geospatial data with ArcGIS Pro", Esri Press; 2nd Edition,2020.
3. Lex Comber and Chris Brunsdon, "Geographical Data Science and Spatial Data Analysis: An Introduction in R (Spatial Analytics and GIS)", SAGE Publications Ltd; 1st edition,2020.
4. Alex David Singleton; Seth Spielman; David Folch, "Urban Analytics (Spatial Analytics and GIS) Series: Spatial Analytics and GIS", SAGE Publications Ltd, 2017.
5. Andrew Crooks, Nick Malleon , Ed Manley, Alison Heppenstall, "Agent-Based Modelling and Geographical Information Systems: A Practical Primer (Spatial Analytics and GIS)", SAGE Publications Ltd; 1st edition,2018.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	-	3	2	-	-	2	2	-	3
CO2	2	2	1	-	3	1	-	-	2	1	1	2
CO3	3	3	2	2	2	2	2	1	1	2	1	3
CO4	1	1	1	-	3	2	-	-	3	2	1	2
CO5	1	1	2	1	3	-	-	-	3	2	-	3
CO6	3	2	3	1	3	1	-	-	2	1	-	3
Average	2	2	2	1	3	1	1	1	2	2	1	3

3- High 2-Moderate 1-Low

BN3004

CINEMA AND CITIES

L T P/S C
3 0 0 3

OBJECTIVES

- To look at the representation of the city in cinema.
- To exploring the links between urban topography and cinematic space across a range of thematic, historical and cultural concerns.
- To attempt cinema as an innovative and powerful archive of urban life.
- To understand how cinema will portray the urban spaces and its associated activities.
- To develop the ability of the students to refer shapes of the settlement, movement of city life, etc.

UNIT I INTRODUCTION 9

Significance of Cinema for understand urban development – Images and use of real buildings in movies – Themes organized in films - From the City to the Cinema - the city as an appropriate scenario to serve the narrative - render in moving pictures the shapes, masses, spaces, surfaces, and textures of the built environment – case studies.

UNIT II FILM AND MODERNITY 9

The City in Cinema - the navigation of space, the creation of point of view and narrative - key aspects of urban history and theory - historical and mythological stories of the past- Cinema manifests and cities - Looking for a “new” in architecture and cities in relation with cinematic thinking.

UNIT III STREET AND SPATIAL DISRUPTIONS 9

Character of streets – Inception the choice of spaces – tangible and intangible activities – visuality and urban experience – consumer cities – public space and surveillance.

UNIT IV URBAN ANXIETIES 9

Exploring the diverse and complex cinematic setting – depiction of cities and urban spaces – urban culture and portrayal of character – effect of politics – race, class, gender equality, splintering urbanism, etc – segregation of time and space.

UNIT V HOPE AND STRUGGLE IN AN INDIAN METROPOLIES 9

Cinema and Indian Urbanism – Social Complexities and vibrant environments - changing urban scape through cinema – memory bank - highlighting the process of urbanization.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Explore and interpret various aspects of the urban experience through films.
- CO2** Witness the transformation of urban spaces from past to present and in future.

- CO3** Examine the imaginaries and understanding of highlighted the space, activity, stratification, etc.
- CO4** Examine the complex and longstanding interrelationship and exchange between film and city.
- CO5** Facilitating a critical encounter with cities, film is considered a mobile representation in which social, geopolitical and cultural meanings are documented, imagined, reassembled, circulated and contested.
- CO6** Examine how film represents the city and its architecture to develop a deeper critical understanding of the relationships between modernization, industrialization and the people's perceptions and experiences.

TEXT BOOKS

1. Clarke, David B. Ed., "The Cinematic City", London and New York, Routledge, 1997.
2. Donald James, "Imagining the Modern City: Minneapolis", University of Minnesota Press, 1999.
3. Friedberg, Anne, "Window Shopping: Cinema and the Postmodern-Berkeley, Los Angeles", Oxford: University of California Press, 1993.
4. Vidler, Anthony, "Warped Space: Art, Architecture & Anxiety in Modern Culture", Cambridge, Massachusetts & London, England, MIT Press, 2001.
5. Neumann, Dietrich, "Film Architecture: From Metropolis to Blade Runner", Prestel, 1999.

REFERENCES

1. Abbott, C, "Imagining Urban Futures: Cities in Science Fiction and What We Might Learn From Them. Middletown", CN: Wesleyan University Press., 2016.
2. AlSayyad, N, "Cinematic urbanism: A history of the modern from reel to real". New York; London: Routledge, 2006.
3. Berger, J, "Ways of Seeing. London", British Broadcasting Corporation: Penguin Books, 1972.
4. Koeck, R., & Roberts, L, "The city and the moving image: Urban projections. Houndmills, Basingstoke, Hampshire; New York", Palgrave Macmillan, 2010.
5. Tobe, R, "Film, architecture and spatial imagination", Milton Park, Abingdon, Oxon; New York, NY: Routledge, 2017.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	1	-	3	2	3	1	2	1	3
CO2	3	2	1	1	-	2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	3	3	3	1	1	2	3
CO5	2	1	3	3	2	3	2	2	1	1	3	1
CO6	3	3	3	3	-	1	2	2	1	1	1	2
Average	3	2	3	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

BN3005

PUBLIC TRANSPORTATION SYSTEMS

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the characteristics of various urban transportation systems
- To learn the concepts of route network design
- To familiarize with scheduling
- To study the planning aspects of terminals
- To be acquainted with sustainable urban transportation systems

UNIT I	TRANSPORT SYSTEMS	9
Urban modes and service types - Technological and operational Characteristics – environmental considerations – relative cost economics – criteria for selection		
UNIT II	ROUTE NETWORK DESIGN	9
Transportation Demand estimation, Data requirements, Network planning - Corridor identification - Route Systems and Capacity		
UNIT III	SCHEDULING	9
Components –Scheduling procedure and patterns –Fleet Requirement – Bus and Crew scheduling - Rail operation design – Scheduling – Frequency and Headway		
UNIT IV	TERMINAL PLANNING	9
Planning and design of terminals - Bus stop capacity – Depot location - Depot layout, Parking patterns, Rail Transit: Station Arrangements - Way capacity and Station Capacity		
UNIT V	SUSTAINABLE URBAN TRANSPORTATION	9
Preferential treatment for high occupancy modes, promoting non-motorized modes of transport - Integrated land use and transport planning – Demand management techniques - Integrated public transport planning; case studies- Smart Cities.		
		TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Compare and select suitable urban transportation systems
- CO2** Design route network
- CO3** Schedule the transit units and crew
- CO4** Apply the concepts of terminal planning
- CO5** Have a knowledge of sustainable transportation systems

TEXT BOOKS

1. Black, Alan, 'Urban Mass Transportation Planning,' McGraw- Hill, Inc., New York, 1995
2. Vukan, R. Vuchic, 'Urban Transit Systems and Technology,' John –Wiley & Sons, New Jersey, 2007.
3. Sigurd Grava, 'Urban Transportation Systems – Choices for Communities,' The McGraw-Hill Companies, 2004
4. Black, William R. 'Sustainable transportation: problems and solutions,' The Guilford Press, 2010

REFERENCES

1. National Urban Transport Policy ,2013
2. Black, Alan, 'Urban Mass Transportation Planning,' McGraw- Hill, Inc., New York, 1995.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		1	3					2	
CO2	3	3	3	3	2	3				1	3	1
CO3	3	3	2	2	2	2		1			3	
CO4	3	3	3	3	2	1		1	1	1	2	
CO5	3	3	3	3	2	3	3		2	1		2
Average	3	3	2	2	2	2	1	1	1	1	2	1

3- High 2-Moderate 1-Low

BN3006	ENVIRONMENTAL, SOCIAL AND GENDER ACTION PLAN	L	T	P/S	C
		3	0	0	3

OBJECTIVES

- To introduce the basic concepts relating to gender and provide logical understanding of gender roles.
- To sensitize the students on cultural construction of masculinity and femininity'
- To apply central concepts and theories from Gender Studies to their own life experiences and the world around them.
- To understand and analyze forces shaping individual experiences as well as social structure and institutions such as the family, workplace, and media.
- To stimulate amongst the students the various strands of feminist thought.

UNIT I FUNDAMENTAL CONCEPTS OF WOMEN'S STUDIES 9

Definition- Objectives of Women's Studies; Importance of Women's Studies; Women's Studies as an Academic Discipline; Role of UGC Centre for Women's Studies; Women's Studies in India and Abroad – Origin and Growth.

UNIT II SOCIAL EMPOWERMENT 9

Women in Higher Education; Gender issues in Health, Environment, Family welfare Measures, Indecent representation of Women in media; Women in Difficult circumstances; Constitutional.

UNIT III ECONOMIC EMPOWERMENT 9

Introduction-organized sector, unorganized sector; Role of Women in Economic Development – Female Poverty and Poverty alleviation programmes; Status of Women farmers and land rights; Women Entrepreneurs; Impact of Globalization on working women; National Policy for the empowerment of women 2001.

UNIT IV POLITICAL EMPOWERMENT 9

Political participation of women – Political Socialization- Women leaders in politics Women in Local Governance- Barriers- Reservation policies- Women's Political Rights: CEDAW.

UNIT V SOCIAL ISSUES REGARDING WOMEN 9

Issues of Girl child, Female, infanticide and foeticide, Sex Ratio child marriage, Dowry & Property Rights, Violence against Women, Domestic violence, Female Headed Households' , Women in the Unorganized sector of Employment, Women's work- Status and problems, problems of Dalit women.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Elucidate the key concepts, terminology, and theoretical frameworks central to the interdisciplinary field of Gender Studies.
- CO2** Appreciate complex interconnections of gender, race, class, sexuality, ability, and other categories of power and identity in various spheres of human endeavor ranging from the socio political to the aesthetic.
- CO3** Demonstrate an openness to learning about people, cultures, and societies different from themselves and their own worlds.
- CO4** Envision themselves as participants in a multidisciplinary dialogue with activists, artists, and academics regarding social, political, and cultural issues of gender.
- CO5** Elucidate the need for Gender action planning.
- CO6** Illustrate the various contexts in which planning emerged as a response to the socio-environmental concerns with a range of circumstances over time.

TEXT BOOKS

1. Amy S. Wharton, "The Sociology of Gender: An Introduction to Theory and Research". (KeyThemes in Sociology) Blackwell Publishing, 2005.

2. Devaki Jain and Pam Rajput, "Narratives from the Women's Studies Family: Recreating Knowledge", Sage, 2003.
3. Jasbir Jain, "Women in Patriarchy: Cross Cultural". Rawat Publications, 2005.
4. Kumkum Sangari and Sudesh Vaid. "Recasting Women: Essay in Colonial History", 1989.
5. Lerner, Gerda. "The Creation of Patriarchy". Oxford University Press, 1986

REFERENCES

1. Maithreyi Krishna Raj, "Women Studies in India: Some Perspectives". Popular Prakasham, 1986.
2. Mala Khullar, "Writing the Women's Movement: A Reader". Zubaan, Kali for Women, 2005.
3. Mies, Maria, "Indian Women and Patriarchy". Concept Publishing Company, 1980.
4. SharmilaRege, "Sociology of Gender: The Challenge of Feminist Sociological Knowledge". Sage, 2003.
5. Veena Majumdar, "Report on the committee on the Status of Women: Towards Equality". Journal of Women Studies, 1974.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	1	3	2	2	3	2	3	3
CO2	3	3	3	3	2	3	1	2	3	2	1	3
CO3	3	2	2	3	2	2	2	1	3	1	1	3
CO4	3	2	2	2	3	3	2	2	2	2	1	2
CO5	3	3	3	3	3	3	2	2	2	2	1	3
CO6	3	3	3	3	2	2	2	2	1	2	1	3
Average	3	3	3	3	2	3	2	2	1	2	1	3

3- High 2-Moderate 1-Low

BN3007

SIMULATION IN PLANNING

L T P/S C
1 0 4 3

OBJECTIVES

- To understand the requirement and process of simulation in Planning.
- To understand different simulation Techniques.
- To understand the land use Dynamics and stimulation methods.
- To enable students to understand about the stimulation in transportation Planning.
- To enable students to understand about the stimulation in environmental Planning.

UNIT I MODELING AND SIMULATION CONEPTS

10

Introduction to a System, model, spatial models, Simulation and Systems Modeling Language; Modelling urban system dynamics, Problem Communication, System Objectives, Development, Life-Cycle System Behavior.

UNIT II SIMULATION TECHNIQUES

10

Simulation Techniques, Modelling and simulation, Growth model, Wolves and sheep model, Simple urban system, grid city, network city, Monte Carlo Method, Importance Sampling, Metropolis Algorithm, Heat- bath algorithm, MD and Verlet algorithm, correlations.

UNIT III SIMULATION ON LAND DYNAMICS AND CHANGE

15

Land Dynamics, factors influencing land dynamics, types of land use dynamics model, economic module, vegetation change module, agent-based module, Introduction to cellular automata for land use change simulation, Overview of urban Simulation software's.

UNIT IV SIMULATION IN TRANSPORTATION 20

Four stages in transportation planning, accessibility and mobility consideration in transportation planning, Importance of simulation in transportation planning, Application of software in transportation Planning.

UNIT V SIMULATION IN ENVIRONMENTAL STUDIES 20

Importance of environment in Planning, components which can be simulated in environment planning, Geographic data for environmental modelling and assessment, Vegetation mapping and monitoring, The land surface atmosphere interface, climate simulation, Envi met for climate simulation.

TOTAL : 75 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Outline the importance of simulation in urban planning.
- CO2** Summarise the different simulation techniques.
- CO3** Evaluate land use dynamics in planning and its importance.
- CO4** Create different simulation in transportation planning.
- CO5** Formulate different simulation techniques in environmental planning
- CO6** Perform various simulation in different software's.

TEXT BOOKS

1. Stefan Müller Arisona, Gideon Aschwanden, Jan Halatsch, Peter Wonka Digital, "Urban Modeling and Simulation", Springer, 2012.
2. Sudhir Kumar Singh, "Remote sensing and GIS: Land Use land cover Dynamics", LAP Lambert Academic Publishing, 2011.
3. Juan de Dios Ortúzar, Luis G. Willumsen, "Modelling Transport", 4th Edition, Wiley Publication, 2011.
4. Andrew Skidmor, "Environmental Modelling with GIS and Remote Sensing", Taylor & Francis Group, 2002.
5. Michele Campagna (Ede), GIS for Sustainable Development, Taylor & Francis Group, 2006.

REFERENCES

1. Xiangzheng Deng , "Modeling the Dynamics and Consequences of Land System Change", Springer; 2011th edition
2. Pinki Mondal, Sonali Shukla Mc Dermid, "Global Vegetation and Land Surface Dynamics in a Changing Climate", Mdpi AG Publisher, 2021.
3. Dan Malkinson, Danny Czamanski, et al, "Modeling of Land-Use and Ecological Dynamics (Cities and Nature)", Springer, 2016.
4. Michael L. Deaton and James J. Winebrake, "Dynamic Modeling of Environmental Systems (Modeling Dynamic Systems)", Springer, 2012.
5. Biswajeet Pradhan, Rajib Shaw, et al, "Impact of Climate Change, Land Use and Land Cover, and Socio-economic Dynamics on Landslides (Disaster Risk Reduction)", Springer, 2022.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	3	2	3	1	3	3	3	3
CO2	3	1	3	2	1	1	2	-	1	2	2	1
CO3	2	3	2	1	3	1	2	1	2	-	1	3
CO4	3	1	1	3	1	2	1	-	1	3	3	3
CO5	3	2	2	1	2	3	1	2	2	3	1	2
CO6	3	1	1	3	2	2	3	1	2	2	1	3
Average	3	2	2	2	2	2	2	1	2	2	2	3

3- High 2-Moderate 1-Low

BN3008	DISASTER RISK MITIGATION AND MANAGEMENT	L	T	P/S	C
		3	0	0	3

OBJECTIVES

- To impart knowledge of causes of various disaster and its impact.
- To understand the concept of Disaster Management Cycle and Framework.
- To explain the Applications of Science and Technology for Disaster Management & Mitigation.
- To understand Disaster Management Mechanisms; Disaster Risk Mitigation; and Post Disaster Measures.
- To develop the ability of the students to refer to and relate with the clauses of NDM Act, propose disaster sensitive land use plan, recommend disaster compliant building bye laws, create resource / social / vulnerability / opportunity map, prepare disaster vulnerability index.

UNIT I INTRODUCTION 9

Hazards and Disasters, Risk and Vulnerability in Disasters, Natural and Man-made disasters, earthquakes, floods drought, landside, land subsidence, cyclones, volcanoes, tsunami, avalanches, global climate extremes. Man-made disasters: Terrorism, gas and radiations leaks, toxic waste disposal, oil spills, forest fires.

UNIT II TYPE OF DISASTER 9

Earthquakes and its types, magnitude and intensity, seismic zones of India, major fault systems of India plate, flood types and its management, drought types and its management, landside and its managements case studies of disasters in Sikkim (e.g) Earthquakes, Landside). Social Economics and Environmental impact of disasters.

UNIT III MITIGATION AND MANAGEMENT TECHNIQUES 9

Basic principles of disasters management, Disaster Management cycle, Disaster management policy, National and State Bodies for Disaster Management, Early Warning Systems, building design and construction in highly seismic zones, retrofitting of buildings.

UNIT IV DISASTER MANAGEMENT IN INDIA 9

Disaster Profile of India, Mega Disasters of India and Lessons Learnt, Disaster Management Act 2005, Institutional and Financial Mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management, Role of Government, Non-Government and Inter-Governmental Agencies.

UNIT V APPLICATION OF TECHNOLOGY FOR DISASTER MANAGEMENT & MITIGATION 9

Geo-informatics in Disaster Management, Disaster Communication System, Land Use Planning and Development Regulations, Structural and Non-Structural Mitigation of Disasters, Science & Technology Institutions for Disaster Management in India.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Explain disaster management basics and theory (cycle, phases, risk, crisis, emergency, disasters, resilience).
- CO2** Understand disasters, disaster preparedness and apply the mitigation measures.
- CO3** Understand role of IT, remote sensing, GIS and GPS in risk reduction.
- CO4** Apply knowledge of disaster management acts and guidelines.
- CO5** Understand disaster management acts and guidelines along with role of various stack-holders during disasters.
- CO6** Compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster.

TEXT BOOKS

1. Roy, P.S., "Space Technology for Disaster management: A Remote Sensing & GIS Perspective", Indian Institute of Remote Sensing (NRSA) Dehradun, 2000.
2. R K Bhandani, "An overview on natural & man-made disasters and their reduction", CSIR, New Delhi.
3. S L Goyal, Deep & Deep, "Encyclopedia of disaster management, Vol I, II and III", Disaster management policy and administration, New Delhi, 2006.
4. H.N. Srivastava & G.D. Gupta, "Management of Natural Disasters in developing countries", Daya Publishers, Delhi, 2006.
5. A.K.Srivastava, "Text book of Disaster Management", Scientific Publishers, 2021.

REFERENCES

1. Coppola D P, "Introduction to International Disaster Management", Elsevier Science (B/H), London, 2007.
2. M C Gupta, "Manual on natural disaster management in India", NIDM, New Delhi.
3. Sharma, R.K. & Sharma, G., "Natural Disaster", APH Publishing Corporation, New Delhi, 2005.
4. Government of India, "Disaster Management Act, 2005.
5. Government of India, "National Disaster Management Policy, 2009.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	-	3	2	3	1	2	1	3
CO2	3	2	1	1	-	2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1	-	1	2	2	1	1	1	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

BN3009

INTELLIGENT TRANSPORTATION SYSTEM (ITS)

L T P/S C
3 0 0 3

OBJECTIVES

- To learn the fundamentals of ITS
- To understand the different types of sensors
- To study the ITS functional areas
- To have an overview of ITS implementation in developed countries
- To learn the implantation of ITS in developing countries

UNIT I INTRODUCTION

9

Introduction to Intelligent Transportation Systems (ITS) – Definition of ITS and Identification of ITS Objectives, Historical Background, Benefits of ITS - ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Geographic Information Systems (GIS), video data collection.

UNIT II TELECOMMUNICATION AND ITS

9

Telecommunications in ITS – Importance of telecommunications in the ITS system, Information Management, Traffic Management Centres (TMC). Vehicle – Road side communication – Vehicle Positioning System

UNIT III FUNCTIONAL AREA OF ITS**9**

ITS functional areas – Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control Systems (AVCS), Advanced Public Transportation Systems (APTS), Advanced Rural Transportation Systems (ARTS).

UNIT IV MANAGEMENT OF ITS**9**

ITS User Needs and Services – Travel and Traffic management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle safety systems, Information Management.

UNIT V APPLICATION OF ITS**9**

Automated Highway Systems - Vehicles in Platoons – Integration of Automated Highway Systems. ITS Programs in the World – Overview of ITS implementations in developed countries, ITS in developing countries, Case studies

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Understand the sensor technologies
- CO2** Understand the communication techniques
- CO3** Apply the various ITS methodologies
- CO4** Understand the user needs for improving ITS
- CO5** Understand the significance of ITS under Indian conditions

TEXT BOOKS

1. Kan Paul Chen, John Miles , 'ITS Hand Book: Recommendations for World Road Association (PIARC),' 2000
2. Sussman, J. M., 'Perspective on ITS,' Artech House Publishers, 2005.
3. Chowdhary, M.A. and A Sadek, 'Fundamentals of Intelligent Transportation systems planning,' Artech House Inc., US, 2003
4. Williams, B., 'Intelligent transportation systems standard,' Artech House, London, 2008

REFERENCES

1. National ITS Architecture Documentation, US Department of Transportation, 2007
2. Black, Alan, 'Urban Mass Transportation Planning,' McGraw- Hill, Inc., New York, 1995.

CO-PO Mapping

PROGRESS THROUGH KNOWLEDGE

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		3	3	3				2	2		
CO2	3	3	3	2	2	1	2	1				
CO3	3	2	2	3	3	2	1		1	2	2	1
CO4	3	3	2		3	3			2	1		1
CO5	3	3	3	2	3	3	3	1	2	3	1	1
CO6												
Average	3	2	2	2	2	2	1	1	1	1	1	1

3- High 2-Moderate 1-Low

OBJECTIVES

- To recognize the importance of water in the urban landscape, and its role in the welfare and health of humans.
- To familiarize with the different ways of identifying opportunities for integrating water into the urban landscape.
- To elucidate the application of water sensitive techniques to integrate the management of water into the urban landscape.
- To inculcate an interest towards sustainability and livability of cities while securing adequate resources for growing cities as well as alternative water sources.
- To expose students to best management practices, state of art knowledge in the area of water sensitive planning.

UNIT I WATER SENSITIVITY**9**

Introduction to water sensitive planning, Concept of water sensitivity, approach, principles, objectives; Need for water sensitive planning; Components of water sensitive planning; Water in the urban landscape, the urban water cycle and its component characteristics; Various sources of water and its quality, use of water, Spatial variations of water availability in India; Water stock, water consumption, and demand for various water uses. Development challenges for water management

UNIT II WATER RESOURCE MANAGEMENT**9**

Water supply management, best practices in water supply management; Water demand management, Strategies for demand management; Social, environmental and economic impacts of urban water management; Strategies for Water pricing, regulation; water conservation measures; Water cycle management, Waste water - Waste water estimation, collection and disposal, and its subsequent use, waste water treatment and management systems, storm water resource management systems. Technological options for wastewater management, recycling, reuse and treatment; Storm runoff management, desalination.

UNIT III PLANNING APPROACHES**9**

Sustainable urban drainage systems and measures for public open spaces: bio retention areas, filter drains, detention basins constructed wetlands, bio swales. Initiatives for ensuring water Sensitivity; Water sensitive planning approaches, Case studies and best management practices of Water-sensitive planning (city/zonal scale), Case studies and best management practices of Water-sensitive designing (neighborhood/institutional scale), Case studies and best management practices of Water-sensitive designing (individual scale). Best management practices and Case Studies of water sensitive street design.

UNIT IV SOCIO-ECONOMIC AND ECOLOGICAL IMPACTS**9**

Economics of Water Sensitivity planning, Factors affecting costs, benefits of water sensitivity planning, Social and ecological impact of Water Sensitivity planning, Role of organizations and institutions working for water Sensitivity in India. Comparison between conventional practice and water sensitive planning approaches for managing urban water resources. Scope of water sensitive planning interventions; Tools and approaches for plan, policy, programme and projects.

UNIT V LEGAL ASPECTS RELATED TO WATER SENSITIVITY PLANNING**9**

Water rights and its legal implication; Legal Aspects of Water & Environment Systems: Principles of Law applied to Water Rights and Water Allocation, Water Laws, Environmental Protection Law, Environmental Constraints on water Resources Development. Development plans and water resource planning; Integration of concepts of water security in urban and regional planning and other development plans; Implementation of water sensitive planning, Stakeholder participation.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Elucidate global and Indian water sensitive challenges.
- CO2** Appreciate the Potential and opportunities for connecting water, urban planning/development.
- CO3** Demonstrate an ability and skills to make development plans and design projects for meeting global and Indian water sensitivity challenges.
- CO4** Formulate water sensitive layouts and street designs.
- CO5** Critically analyse the implementation and institutional issues relating to water sensitive planning, including maintenance and policy.
- CO6** Illustrate the various technologies, strategies, regulations involved in water management..

TEXT BOOKS

1. B.C. Punmia & Ashok Kumar Jain, 'Waste water engineering', Lakshmi Publications, 2005.
2. Asit K. Biswas & Cecilia Tortajada, 'Water Pricing and Public Private Partnership', Routledge, 2005.
3. Hoekstra A.Y, "The Water Footprint of Modern Consumer Society", Routledge, 2013.
4. David Butler and Fayyaz Ali Memon, 'Water demand management', IWA Publishing, 2006.
5. Sharp L, "Reconnecting People and Water, Public Engagement and Sustainable Water Management", Earthscan, 2017.

REFERENCES

1. Ramaswamy, R. Iyer, "Water and the Laws in India", Sage, 2009.
2. Cori L. Barraclough and Wm. Patrick Lucey, 'Water Sensitive Urban Design', <http://www.oaa.on.ca/oaamedia/documents/watersensitiveurbandesign.pdf>
3. Water sensitive urban design in the UK – Ideas for built environment practitioners', (2013) CIRIA, London.
4. Jacqueline Hover, "Water Sensitive Urban Design: Principles and Inspiration for Sustainable Stormwater Management in the City of the Future", 2011.
5. Ashok Kumar and D.S. Meshram, "Future of Cities: Planning, Infrastructure, and Development", Routledge.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	2	3	2	3
CO2	3	3	3	2	2	3	2	2	3	2	2	3
CO3	3	2	2	3	2	3	2	2	3	3	2	2
CO4	2	3	3	2	2	3	2	2	3	2	2	2
CO5	2	2	3	2	2	3	2	2	2	2	2	3
CO6	2	3	2	3	2	2	2	2	2	2	2	2
Average	3	3	3	3	2	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

BN3011

WEB BASED APPLICATIONS IN PLANNING

L T P/S C
1 0 4 3

OBJECTIVE

- To introduce the fundamentals of cloud computing and principles of web-based application
- To learn the use of a variety of strategies and tools for data analysis
- To understand the nature of web-based data available at the rural, urban, and regional levels of planning
- To understand the collection and interpretation of data from the web-based applications
- To understand the role of state and central government agencies in cloud computing and geoinformatics

UNIT I	WEB-BASED GIS PLATFORMS IN INDIA	15
National GIS mission NIC – Products and platforms; Centre Level and State Level – PRAYAS, Collab GEO, SVAMITVA, Bhuvan, Jal Jeevan, etc		
UNIT II	BHARAT MAPS, BHUVAN	15
Direct Benefits Transfer, Spatial Data services framework, access in Government-to-Government Function ; SWAMITVA, DBT GIS, Green watch, etc		
UNIT III	TNGIS	15
Data available in TNGIS, accessing TNGIS, Accessing data; Physical infrastructure, social infrastructure, transportation and natural resources		
UNIT IV	CLOUD DATA AND FREE GIS DATA SOURCES	15
GIS and cloud computing, Cloud GIS, Qfield, ArcGIS insights; Open Street Map, ESRI open data hub, NASA's SEDAC, NASA Earth Observation		
UNIT V	CASE STUDIES AND PROJECTS	15
Neighborhood data collection from various data available online Physical infrastructure and social infrastructure services mapping		

TOTAL: 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- To know various government portals to collect GIS-based web data.
- To demonstrate skills to examine various data collected from the web portals.
- To know the Government-to-government functions.
- To identify various roles of State and Central Government agencies with respect to geoinformatics, GIS and urban planning
- To know how to use cloud computing for data access, data collection and mapping
- To collect all Web-based data for various levels of planning – rural, urban, regional

TEXT BOOKS

1. Saha, K., Froyen, Y. K, "Learning GIS Using Open-Source Software: An Applied Guide for Geospatial Analysis", Taylor & Francis, 2021.
2. Naveenchandra N. Srivastava, "Emerging Trends in Open Source Geographic Information Systems", United States: IGI Global, 2018.
3. Graser, A., Cutts, A, "Learn QGIS: Your Step-by-step Guide to the Fundamental of QGIS 3.4", 4th Edition. United Kingdom: Packt Publishing, 2018.
4. Vacca, J, "Solving Urban Infrastructure Problems Using Smart City Technologies: Handbook on Planning, Design, Development, and Regulation", Elsevier Science, 2020.
5. Zheng, Y, "Urban Computing" MIT Press, 2019.

REFERENCES

1. Pieter Pauwels, Kris McGlenn, "Buildings and Semantics: Data Models and Web Technologies for the Built Environment", Netherlands: CRC Press, 2020.
2. Winston Yap, Patrick Janssen, Filip Biljecki, "Free and open source urbanism: Software for urban planning practice", Computers, Environment and Urban Systems, Computers, Environment and Urban Systems, Volume 96, September 2022.
3. Praharaj, Sarbeswar, "Development Challenges for Big Data Command and Control Centres for Smart Cities in India", Springer, 2019.
4. Maciej M. Nowak, Katarzyna Dziób, ŁukaszLudwisiak, Julian Chmiel, "Mobile GIS applications for environmental field surveys: A state of the art, Global Ecology and Conservation", Global Ecology and Conservation, Volume 23, September 2020.
5. M. Mazhar Rathore, Awais Ahmad, Anand Paul, Seungmin Rho, "Urban planning and building smart cities based on the Internet of Things using Big Data analytics, Computer Networks", Computer Network, Volume 101, June 2016.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	3	2	3	1	3	3	3	3
CO2	3	2	1	2	1	1	2	-	1	2	2	1
CO3	2	3	2	3	3	1	2	1	2	-	2	2
CO4	3	1	1	3	1	2	1	-	1	-	2	3
CO5	3	3	2	1	2	1	1	2	2	3	1	2
CO6	3	1	1	3	3	2	3	1	2	3	3	3
Average	3	2	1	2	2	2	2	1	2	2	2	2

3- High 2-Moderate 1-Low

BN3012

DEVELOPMENT REGULATIONS

L	T	P/S	C
3	0	0	3

OBJECTIVES

- Familiarize the students on the concept of development and highlight the importance of regulated physical development.
- Acquaint the students on the importance of Planning approach, with particular reference to land use zones, and regulations relating to development of land and buildings.
- Knowledge in Planning, coordinating and supervising proper and orderly development.
- Understand the Effective and efficient delivery of urban services.
- Familiarize the public domain activity wherein the community has a significant role in planning, executing and managing development in their local areas.

UNIT I INTRODUCTION

9

Introducing Act relating to Town Planning- Aspects of development- Physical, Social, and Economic – Importance of physical development - Need for regulatory measures – Tools for regulating the development - Master plan and development regulations.

UNIT II ACTS RELATING TO LAND DEVELOPMENT

9

Indian forest act 1927 – Environmental protection act 1986 – Indian monument act – Hill region development act – Regulations relating to development of integrated townships, Special economic zones, export processing zones, and IT Parks.

UNIT III LAND DEVELOPMENT REGULATIONS

9

Norms governing residential and industrial layouts - Linkage, Hierarchy of roads, Plot size, Frontage, and Open Space Reservations – Reservation of land for EWS - Allocation of land for public purposes - Classification of buildings - Building Height, Number of floors, Floor space index – Parking requirements - Provision of utilities and services.

UNIT IV PLANNING NORMS

9

Tamil Nadu Combined Development and Building Rules, 2019, Special Economic Zone and Information Technology parks developments in Tamil Nadu - Comparative analysis of development and management regulations in various metropolitan cities.

UNIT V FINANCING URBAN DEVELOPMENT

9

Financing urban development projects; Sources of funding: cost recovery, cost subsidization, medium- and long-term financing - Private investments in urban development projects: prospects and limitations - Municipal financing: sources of revenue and items of expenditure - Financial resource mobilization for urban development particularly for municipal/ local bodies.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Develop the skills required to prepare comprehensive land development proposals.
- CO2** Develop knowledge gather requisite capabilities to scrutinize the land and building development proposals initiated by the public and private.
- CO3** Provides guidelines for the physical development of the city.
- CO4** Identify relevant development issues.
- CO5** Identify opportunities for and constraints to development.
- CO6** Identify areas which are suitable/ unsuitable for different types of development; make proposals for the way in which the area should develop over time.

TEXT BOOKS

1. William I. Goodman and Eric C. Freund, "Principles and Practice of Urban Planning", Goodman, 1968.
2. Julian Conrad Juergensmeyer and Thomas E Roberts, "Land Use Planning and Development Regulation Law", Gale Cengage, 2007.
3. Robert E.Merritt and Ann R.Danforth, "Understanding Development Regulations", Solano Pr, 2005.
4. Jean-Jacues Laffont, "Regulation and Development", Cambridge University Press, 2005.
5. David W.Owens, "Introduction to Zoning and Development Regulation", UNCS School of Government, 2014.

REFERENCES

1. Government of Tamil Nadu, 'Tamil Nadu Combined Development and Building Rules, 2019.
2. Ministry of Commerce & Industry, Government of India, 'Special Economic Zone Rules' 2006.
3. Government of India, 'National Building Code of India, 2016, Bureau of Indian Standards, New Delhi, 2016.
4. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.
5. Chennai Metropolitan Development Authority, 'Second Master Plan for Chennai Metropolitan Area 2026' 2008.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	-	3	2	3	1	2	1	3
CO2	3	2	1	1	-	2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1	-	1	2	2	1	1	1	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

BN3013

TRANSPORTATION MODELLING

L T P/S C
3 0 0 3

OBJECTIVES

- To learn the fundamentals of transportation planning
- To understand the classical methods of urban transportation planning
- To understand the trip generation and trip distribution concepts
- To learn the mode and route choice behavior of trip makers
- To be acquainted with the transportation landuse interaction
- To learn the fundamentals of transportation planning

- UNIT I INTRODUCTION 9**
Introduction to traffic flow - Trip based and Activity based approach - Urban Transportation Planning - Model building, Forecasting and Evaluation - Study area delineation – Zoning - UTP survey.
- UNIT II TRANSPORT DEMAND MODEL 9**
Transport demand models - Trip generation models – Trip classification - productions and attractions - Trip distribution models – Growth factor models, Gravity model and Opportunity modes.
- UNIT III PROBABLISTICS MODEL 9**
Probabilistic models - Utility functions - Logit models - Two stage model. Traffic assignment – Transportation networks – Minimum Path Algorithms - Assignment methods – All or Nothing assignment and Multi path assignment - Route-choice behavior.
- UNIT IV LAND USE AND TRANSPORT MODELS 9**
Microscopic transport models - Driver Behaviour Models - Traffic Simulation Models - Landuse transportation models – Urban forms and structures - Location models - Accessibility – Landuse models - Lowry derivative models
- UNIT V ADVANCE TRANSPORT MODEL 9**
Regional Transport Models – Software in transport modelling – Introduction to TransCAD – Transport dataset and application – International practices.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Interpret the urban activity system and travel patterns
- CO2** Demonstrate the classical methods of urban transportation modelling
- CO3** Apply four stage travel demand modeling
- CO4** Understand the trip generations and trip distribution concepts
- CO5** Understand the mode and route choice of trip makers

TEXT BOOKS

1. Hutchinson, B.G., ‘Principles of Urban Transport Systems Planning,’ Scripta, McGraw-Hill, NewYork, 1974
2. Khisty C.J., ‘Transportation Engineering - An Introduction,’ Prentice Hall, NJ, 2007.
3. Papacostas C.S. and Prevedouros, P.D., ‘Transportation Engineering & Planning,’ PHI, New Delhi, 2002.

REFERENCES

1. Hutchinson, B.G., ‘Principles of Urban Transport Systems Planning,’ Scripta, McGraw-Hill, NewYork, 1974.
2. Khisty C.J., ‘Transportation Engineering - An Introduction,’ Prentice Hall, NJ, 2007.
3. ‘Transport analysis guidance: WebTAG,’ 2012.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	3	2	1		2	1	2	
CO2	3	3	2	3	3	2	3					1
CO3	3	3	3	3	3	2	1	1			2	
CO4	3	3	3	3	3	2			2	1	1	
CO5	3	3	2	2	3	1	1				2	1
Average	3	2	3	2	3	2	1		2	1	2	

3- High 2-Moderate 1-Low

OBJECTIVES

- To identify appropriate methods of design inquiry and problem solving processes to produce creative solutions to identified problems and questions;
- To introduce the different ways in which humans have shaped and designed landscapes across history and region in terms of need, culture and experience.
- To provide an overview of ecological balance and impacts of human activities today and stress on the role and scope of landscape design in sustainability and environmental conservation.
- To gain familiarity with the various elements and principles of landscape design and its contribution to human built environment.
- To introduce analytical and technical aspects involved in site planning and open space design.

UNIT I INTRODUCTION TO LANDSCAPE 9

Landscape as an outcome of natural processes; Humans' evolving relationship with nature and its expression in the designed landscape; Exploration through civilization – Man made landscape in history; Need for natural landscape and tourism in the context of sustainability; A comparative study of the major traditions of landscape design in the east and west with regards to principles and techniques of design with landform, water and vegetation; Utopias: a new vision based on equitable distribution of open spaces.

UNIT II URBAN OPEN SPACES 9

Characteristics and components of open space patterns in towns and cities (traditional and contemporary) basic types. Evolution of Public places including their typology, size, nature, distribution in the urban realm; Relevance of heritage districts and precincts in the modern city; Design of urban streetscape; Transformation of nature of community recreation and its impact on form of cities. Urban spaces as components of urban landscape - Streets, squares, plazas, gardens, Ghats and maidan and parks; Public parks at district, local and neighborhood levels, Interaction spaces; Park systems.

UNIT III URBAN GREEN SPACES 9

Design with nature concept; Urban green space for site planning and recreation; Classification of green spaces; Design proposals to respond to constraints and opportunities offered by the site; Study of open space structure as a basic component of a planning and process of arriving at a landscape concept; The role of vegetation; Environmental benefits of planting, functional requirements, aesthetic considerations; typical situations and criteria for design with plants and selection of species.

UNIT IV LANDSCAPE PLANNING 9

Urban landscape and its transformation; Distinguishing the components of landscape at various levels; Principles of analysis and assessment of existing landscape; Landscape planning related to land-use, circulation networks and activity; Street furniture as a component of urban landscape. Landscape engineering- levels and grading including principles of cut and fill alignment, drainage. Vertical gardens; Rain water harvesting, Deforestation; Case studies and best practices.

UNIT V LANDSCAPE MANAGEMENT 9

Role of government and NGOs, community participation; Political aspects that influenced landscape; Legal measures for managing open spaces, parks; Afforestation program undertaken by state government; De-forestation; Policy frameworks for landscape restoration; Conservation polices and biodiversity governance models.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Elucidate the role of nature in enhancing quality of life in urban settings.
- CO2** Appreciate landscape tools in design and planning of urban spaces.
- CO3** Demonstrate sensibility towards nature-inclusive development in complex urban and

regional scenarios.

CO4 Formulate reasons for evolution of landscapes across time and context.

CO5 Critically analyse the role of natural and human actions with respect to macro scale of sustainability and ecology as well as in the micro scale of shaping of outdoor environments.

CO6 Illustrate landscape design with respect to site planning and different functional typologies of spaces.

TEXT BOOKS

1. Guha R, "Environmentalism: A Global History", Longman, 2000.
2. Rahoul B Singh, 'Gardens of Delight- Indian Gardens through the Ages', Lustre Press, Roli Books, 2008.
3. Beatley T, "Biophilic cities: integrating nature into urban design and planning", Island Press, 2011.
4. McHarg, I. "Design with Nature", Wiley, 1995.
5. Motloch, J.L, "An Introduction to Landscape Design", John Wiley and Sons, 2001.

REFERENCES

1. Ghavampour, E., Vale, B. & Aguila, M. D., n.d. Nature as a Design Element in Small Urban Public Spaces. [Online] Available at: <http://www.sustasis.net/GhavampourVale-Aguila.pdf>
2. Thompson, C. W., 2002. Urban Open Space in the 21st Century. [Online] Available at: https://www.researchgate.net/publication/222403215_Urban_Open_Space_in_the_21st_Century
3. Thompson, C. W., 2002. Urban Open Space in the 21st Century. [Online] Available at: https://www.researchgate.net/publication/222403215_Urban_Open_Space_in_the_21st_Century
4. T.K. Bose and Chowdhury, 'Tropical Garden Plants in Colour', NayaUdyog, 2011.
5. Geoffrey And Susan Jellicoe, 'The Landscape of Man', Thames And Hudson, 1985.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	3	2	3	3
CO2	3	3	3	3	2	3	2	2	3	2	2	3
CO3	3	2	2	3	3	3	2	2	3	2	2	3
CO4	3	3	2	2	3	3	2	2	2	2	1	3
CO5	3	2	2	2	2	3	2	2	3	2	2	3
CO6	3	2	2	2	2	3	2	2	3	2	2	3
Average	3	3	2	3	2	3	2	2	3	2	2	3

3- High 2-Moderate 1-Low

BN3015

BIG DATA IN URBAN PLANNING

L	T	P/S	C
3	0	0	3

OBJECTIVES

- To understand the usefulness of Big data in Urban planning.
- To understand the necessity of collecting big data in different sectors
- To study the type of data and its implication in urban planning.
- To make detailed analyses, which can influence the design of cities and support the creation of data-based policies, plans, and projects
- To Provide students with knowledge of advanced Big Data Analysis and Geo informatics principles, with a focus on how they apply to urban and regional planning.

UNIT I INTRODUCTION **9**
Evolution of Concept: Cloud, Internet of Things and Big Data, Types of Big Data, Concept of Urban Metabolism, Big Data in Urban Planning.

UNIT II BIG DATA FOR CITIES **9**
Investigating the city and its spatial, social, and economic dynamics through the lens of data and visual analytics. Utilizing large public datasets to develop knowledge about visual methods for analyzing data and communicating results. Developing a critical understanding of data structures, collection methodologies, and their inherent biases.

UNIT III URBAN SENSING **9**
Context, Currently Available Datasets, 'Real-Time' Planning, Pervasive Technology and Digital Footprint; Urban Dynamics; Applications of Urban Sensing: Mobile Phone Network Data, Event Driven Network Data; Urban Sensing Applications, Monitoring Land Use and Land Use Inferences, Sensing Urban Mobility and other urban issues.

UNIT IV CASE STUDIES AND RELEVANT RESEARCHES **9**
Global and national case studies for Sensing Urban Problems, Sensing Urban Mobility, Deciphering Urban Activities etc using big data applications.

UNIT V BIG DATA IN URBAN DESIGN AND PLANNING **9**
Experimenting big data using online tools, Tools are the foundations of innovative participation methods, Public Participation Geographic Information Systems (PPGIS) or Citizen Design Science, Potentials of creative data mining. Creating direct bridges between policy-makers and citizens and supports real-time views of a particular city.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Choose various government portals to collect GIS-based web data.
- CO2** Define the necessity of Big Data in planning
- CO3** Develop the ways of collecting big data in various sectors.
- CO4** Utilising Big Data sources to assess urban issues in different sectors
- CO5** Develop 3D multi-data maps, converting data between different formats
- CO6** Develop an experimental approach in data collection.

TEXT BOOKS

1. Zhenjiang Shen, Miaoyi Li, "Big Data Support of Urban Planning and Management", Springer, 2018.
2. Arnab Jana, "Advances in Urban Planning in Developing Nations Data Analytics and Technology", Routledge, 2010.
3. Simon Elias Bibri, "Big Data Science and Analytics for Smart Sustainable Urbanism", 2019.
4. Luca Saverio Valzano, Carlo Caldera, Carlo Luigi Ostorero, Valentino Manni, Andrea Galli, "Generative Computational Urban Planning Through Big Data Analysis", IGI Global publisher, 2021.
5. Nathan Marz and James Warren, "Big Data: Principles and Best Practices of Scalable Real-Time Data Systems", Manning Publications, 2015.

REFERENCES

1. Alasdair Rae, Cecilia Wong, "Applied Data Analysis for Urban Planning and Management", Sage Knowledge, 2021.
2. Thomas Erl Wajid khataak, Paul Bhuler, "Big Data Fundamentals: Concepts, Drivers & Techniques", Service tech press, 2015.
3. Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", Wiley; 1st edition, 2014.
4. Thomas H. Davenport, "Big Data at Work: Dispelling the Myths, Uncovering the Opportunities", Harvard Business Press 2014.
5. Cole Nussbaumer Knaflic, "Storytelling with Data: A Data Visualization Guide for Business Professionals", Wiley; 1st edition, 2015.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	1	2	3	1	3	3	2	3
CO2	3	2	3	2	1	1	2	-	1	2	2	1
CO3	2	3	2	3	3	1	2	1	2	-	1	2
CO4	2	1	-	3	1	2	3	-	1	1	2	3
CO5	3	2	2	-	2	1	1	2	2	3	1	2
CO6	3	1	1	3	3	2	3	1	2	3	3	3
Average	3	2	2	2	2	2	2	1	2	2	2	2

3- High 2-Moderate 1-Low

BN3016

REAL ESTATE MANAGEMENT

L T P/S C
3 0 0 3

OBJECTIVES

- To enable understanding of land as a resource and a commodity.
- To provide adequate inputs to help understand the whole development process as a seamless activity and be aware of the tactical aspects of the entire process of real estate development.
- To equip students with the knowledge of various layout planning parameters and approval process involved.
- To encourage students to explore current trends in asset building and property development.
- To enable an appreciation of the role of team work to make a successful project.

UNIT I INTRODUCTION 9

Fundamental Concepts - Physical/Economic Characteristics, Types of Real Estate, Techniques & Sequential events in Real Estate Development Process - surveys and data rationalization; Development planning – Preparation and Interpretation.

UNIT II PRE PROJECT-STUDIES AND EVENTS 9

Site-Inventory, Evaluation & Feasibility Studies, Understanding & Analysis of Trends and Market Trajectories (Micro and Macro market), Factors affecting real estate demand, Development Team assembly.

UNIT III LAYOUT/DEVELOPMENT PLANNING & APPROVAL PROCESS 9

Planning objectives, Layout Planning Parameters-Plot, Road Network, Infrastructure and open spaces, Efficiency of Layout/Development, Master plan & Detailed Development Plan. Front end clearances and Approvals from various authorities.

UNIT IV CURRENT TRENDS IN REAL ESTATE 9

SEZ, SPV, Joint ventures, Franchisee systems, Types & Parameters, Smart city concepts, Green building, Certifications and Rating for Buildings/Townships (IGBC, CARE, CRISIL, ICRA).

UNIT V MARKETING TOOLS 9

Business Communication Tools required for presenting the project, in house sales promotion, public relations, transfer of completed project, Setting of Project Management Office, Estate Management.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Make use of land as a resource and public domain and its endless opportunities for inclusive growth.
- CO2** Construct skill in applying the various principles and techniques taught in the subject in real estate design and development process.
- CO3** Understand the principles in transactions relating to the allied operations of real estate.
- CO4** Criticize the recent trends and innovations in real estate.
- CO5** Evaluate the completed projects and communication tools required for presenting the project.
- CO6** Delineate project development process, compare the different sources of real estate funds and classify the risks associated therein.

TEXT BOOKS

1. Fillmore W Galaty, "Modern Real estate practice", Dearborn Trade Publishing, New York, U.S.A, 2002.
2. Gerald R Cortesi, "Mastering Real estate principles", Dearborn Trade Publishing, New York, U.S.A, 2001.
3. Mike .E. Miles, "Real estate development – Principles & Process 3rd edition, Urban Land Institute, ULI – Washington DC, 2000.
4. Richard B Peiser & Anne B. Frej, "Professional real estate development" – The ULI guide to the business, Urban Land Institute U.S.A, 2003.
5. Tanya Davis, "Real estate developer's handbook", Atlantic pub company, Ocala, USA, 2007.

REFERENCES

1. Richard Card and John Murdoch, "Real Estate Management Law", OUP Oxford Publication, 2011.
2. Ernie Jowsey, "Real Estate Concepts: A Handbook", Routledge, Publication, 2014.
3. Michael Blackledge, "Introducing Property Valuation", Routledge, Publication, 2016.
4. Nicholas Dunlap, "Principles of Real Estate Management", 17th Edition, Institute of Real Estate Management, 2019.
5. Yogesh Sharma, "Real Estate Planning How to Buy a House", Prabhat Prakashan Pvt.Ltd, 2021.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	-	3	2	3	1	2	1	3
CO2	3	2	1	1	-	2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1	-	1	2	2	1	1	1	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

BN3017

LOGISTICS PLANNING

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the fundamental concept of planning in material procurement
- To understand the mode choice and freight management
- To understand the strategy for logistic planning
- Concept of supply chain management
- Legal aspects in logistic planning

UNIT I INTRODUCTION 9

Introduction to Logistics planning - Concepts, Definition, Evolution and Importance; Urban Logistics Ecosystem; Logistics Planning: Logistics Parks/ Hubs; Warehousing and Material Procurement; Material Storage, Handling, Processing, Packaging and Transportation; Third Party and Fourth Party Logistics; Reverse Logistics and Logistics in Trade

UNIT II FREIGHT TRANSPORT LOGISTICS 9

Management of Freight Transport Logistics and Mode Choice; Mode Characteristics and Key Features of Different Modes; Inter-Modal and Multi-Modal Transport; Shipping Business Environment and Containerization; Transport Cost Drivers; Freight Rate Structures; Freight Transport Best Practices: Vehicle Access and Loading / Unloading Operations, Low Emission Zones, Night Deliveries, Nearly Delivery Areas, ITS Applications

UNIT III STRATEGIES FOR LOGISTIC AND FREIGHT DEMAND 9

Strategic Logistic Management Determinants of Freight Demand; Distribution Channels and Distribution Costs; Logistics Acquisition and Production; Sourcing and Contracting; Logistics Network Planning: Vehicle Routing and Scheduling, Fleet Sizing, Location Decisions

UNIT IV SUPPLY CHAIN MANAGEMENT 9

Supply Chain Management Fundamentals of Supply Chain Management (SCM): Concept and Components; Supply-Demand Variables; Customer Services; Drivers of Supply Chain Performance; Supply Chain Segmentation: Product, Demand, Supply and Market Segmentation; Emerging Trends and Global Practices of SCM; e-commerce and Logistics

UNIT V LEGAL ASPECT 9

Legal Aspects and Liabilities Statutes and Policies for Different Logistics Operations in India and Abroad; Liabilities and Liabilities Resolution; Marine / Cargo Insurance; Freight Quality Partnerships: Case Studies

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Plan concept for procurement of materials
- CO2** Understand Different modes involved in logistic planning
- CO3** Explore Best practices involved in logistic planning
- CO4** Fix Strategy to be followed for satisfying the demand and distribution of materials
- CO5** Understand emerging Trends and Global Practices of supply chain management
- CO6** Understand Logistic operation and legal aspects in India

TEXT BOOKS

1. I. Baluch, 'Transport Logistics: Past, Present, and Predictions,' Winning Communications, 2005.
2. Edmund J. Gubbins, 'Managing Transport Operations,' Kogan Page Ltd, 2003.
3. KW Ogden, 'Urban Goods Movement – A guide to policy and planning' Ashgate Pub., 1992.
4. R.Z. Farahani, S. Rezapour, L. Kardar, 'Logistics Operations and Management' Elsevier Inc., 2011.

REFERENCES

1. Donald Waters, 'Logistics – An Introduction to supply chain Management,' Palgrave Macmillan, 2003.
2. 'Urban Transportation and Logistics- Health, Safety and Security Concerns,' CRC Press, Taylor & Francis Group, 2014.
3. Max Gath, 'Optimising Transport Logistics process with Multi agent Planning & Control,' Springer, 2015.
4. A. Rushton, P. Chroucher, P. Beker, 'The Handbook of Logistics and Distribution Management,' Kogan Page Ltd, Fourth edition 2010.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	2	1		1	1	2	3	1
CO2	3	3	2	2	1	2	1	1	2		2	
CO3	3	2	3	3	3	2	1		2	1	2	
CO4	3	3	3	3	3	2	2	3	2	1	1	1
CO5	3	3	3	3	2	2	1	1			2	1
CO6	3	2	1	2	1	1	1				1	1
Average	3	3	2	3	2	2	1	1	1	1	2	1

3- High 2-Moderate 1-Low

BN3018

ENERGY ACCOUNTING AND AUDITING

L T P/S C
3 0 0 3

OBJECTIVES

- To expose students to the concepts of energy management, audit and accounting
- To enable students in identifying the quality and cost of various energy inputs.
- To assess present pattern of energy consumption in different cost centers of operations.
- To enable students in relating energy inputs and production output.
- To identify potential areas of thermal and electrical energy economy.

UNIT I GENERAL ENERGY PROBLEM

Energy Use Patterns and Scope for Conservation, Energy Audit: Definition, Need and Types of Energy Audit; Energy Management (Audit) Approach, Energy Monitoring, Energy Accounting and Analysis

UNIT II ENERGY MANAGEMENT

Energy Management Information System. Energy Audit Instruments; Energy Conservation Act; Duties and Responsibilities of Energy Manager and Auditors, Energy Management in Industries

UNIT III ELECTRICAL ENERGY CONSERVATION

Electrical Energy Conservation in Building, Heating and Lighting, Domestic Gadgets, Such as Energy Efficient Motor, Pump and Compressor, Energy Conservation in Boilers, Steam Turbine and Industrial Heating System; Cogeneration and Waste Heat Recovery; Thermal Insulation; Heat Exchangers and Heat Pump, Thermal Energy Audit in Heating, Ventilation and Air Conditioning. Building System Energy Audit Tariffs and Power Factor Improvement in Power System, Load Curve Analysis and Load Management

UNIT IV BUILDING DESIGN

Assessment of Need of Energy. Building Materials, Role of Building Design to Evaluate the Energy Performance, Parameters Affecting Energy Consumption, Energy Saving Potential, Energy Survey and Energy Audit of Buildings. Calculation of Energy Inputs in Buildings. Energy Audit Reports of Buildings

UNIT V INTRODUCTION TO GREEN BUILDING

Past, Present and Future of Green Building Movement, Introduction to Energy Rating of Buildings Green Building through Integrated Design; Building a Certified Green Building from Concept to Design to Construction, Green Building Materials and Construction – Alternative, Natural and Sustainable Building Materials; Recycling and Construction Ecology, The Future of Green Buildings – Net Zero, Passive Design Etc.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Elucidate the ways and means by which goods and services can be provided with the least cost and least environmental effect.
- CO2** Appreciate energy conservation programmes, energy utilization analysis and evaluation of energy conservation measures.
- CO3** Demonstrate ability to monitor and analyse techniques of use of energy. towards nature-inclusive development in complex urban and regional scenarios.
- CO4** Formulate technical reports and give recommendations for improving energy efficiency.
- CO5** Critically analyse action plan to reduce energy consumption in select case examples.
- CO6** Illustrate the concept, components and practices of green building.

TEXTBOOKS

1. Sreve Dory, "Commercial Energy Auditing Reference Handbook", Taylor & Francis, 2008.
2. Murphy W R, "Energy Management", Elsevier, 2003.
3. Thumann A, Younger W J, "Handbook of Energy Audits", The Fairmont Press, 2008.
4. Ganesan Gokul, "Energy Audit and Management" CRC Press, 2022.
5. Sharma K V, Venkateshaiah P, "Energy Management and Conservation", I K International Publishing House, 2011.

REFERENCES

1. Descottes, Herve and Cecilia E. Ramos, 'Architectural Lighting: Designing with Light and Space, Princeton Architectural Press, Princeton, 2013.
2. A.K.Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual', CBS, 2015.
3. A.K.Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual', CBS, 2012.
4. A.F.C. Sherratt, 'Air Conditioning and Energy Conservation', The Architectural Press, London, 1980.
5. Swenson S. Don, 'Heating, Ventilating and Air Conditioning', American Technical Publishers, 2003.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	2	3	3	3	2	3	2	2
CO2	3	2	1	1	1	3	2	3	1	2	2	3
CO3	2	2	3	2	2	2	2	2	1	2	1	2
CO4	3	2	3	3	2	2	2	2	1	1	1	3
CO5	2	2	3	1	2	2	3	3	1	1	1	2
CO6	2	3	2	1	1	1	3	3	1	1	3	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

BN3019

ARTIFICIAL INTELLIGENCE IN PLANNING

L T P/S C
3 0 0 3

OBJECTIVES

- Understanding the basic concepts of AI in urban planning
- Understanding how AI applications, building on GIS and remote sensing (RS) technologies, can be used for urban planning
- Use AI methods for satellite classification
- Use AI methods for spatial modeling and analysis in urban applications
- Bringing a critical and judicious assessment to AI processing and applications

UNIT I THEORETICAL FOUNDATIONS	9
A new agenda for AI-based urban planning, AI and the limits of human creativity in urban planning and design, Complexity science for urban solutions.	
UNIT II AI TOOLS AND TECHNIQUES	9
Classes of AI tools, techniques, and methods; urban form analysis through morphometry and machine learning; AI-driven BIM on the cloud.	
UNIT III AI IN URBAN SCALE RESEARCH	9
Urban analysis for health; spatial design for energy self-sufficient communities; optimizing urban grids layouts using proximity metrics.	
UNIT IV AI FOR SMART CITIES	9
The mission, key areas of innovation, the role of AI in smart cities mission, measuring how smart the Indian cities are, case studies, and comparison of approaches	
UNIT V CASE STUDIES	9
Barcelona Superblock, Pune, Singapore, Integrated Command and Control Centre, Dubai, Boston, Buenos Aires, Fukuoka.	

TOTAL: 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- To Explore the current state of Artificial Intelligence and Machine Learning (ML), with particular emphasis on their applications in the fields of Architecture, Landscape, Urbanism and Real Estate
- Gain an understanding of Artificial Intelligence and Machine Learning that allows you to better assess and compare products and services powered by algorithms
- To use various tools and techniques.
- To know about applications of AI in research and urban systems.
- To know how to use cloud computing for data access, data collection, and mapping
- To have a view for the meaningful use of AI technology in the future

TEXT BOOKS

1. Imdat As, Prithwish Basu, Pratap Talwar, "Artificial Intelligence in Urban Planning and Design Technologies, Implementation, and Impacts", Elsevier, 2022.
2. Lyu, Kangjuan, Hu, Min, Du, Juan, "AI-Based Services for Smart Cities and Urban Infrastructure", Business Science Reference, 2020.
3. Christopher Grant Kirwan, Fu Zhiyong, "Smart Cities and Artificial Intelligence: Convergent Systems for Planning", Design, and Operations 1st Edition, 2020.
4. Jinmo Rhee , Context-rich Urban Analysis Using Machine Learning: A Case Study in Pittsburgh, Eliva Press, 2020.
5. Chandan Kumar Shiva, "Artificial Intelligence and Machine Learning in Smart City Planning", Elsevier - Health Sciences Division, 2023.

REFERENCES

1. Vacca, J, "Solving Urban Infrastructure Problems Using Smart City Technologies: Handbook on Planning, Design, Development, and Regulation. Netherlands" Elsevier Science,2020.
2. C. Daniel & C. Pettit, "Digital disruption and planning – use of data and digital technology", professional planners, and perceptions of change to planning work, Australian Planner, 57:1, 50-64, 2021.
3. Adegbola Ojo, "GIS and Machine Learning for Small Area Classifications in Developing Countries", CRC Press; 1st edition, 2023.
4. S Carta, "Machine Learning and The City: Applications In Architecture And Urban Design", Wiley-Blackwell, 2022.
5. Ivana Semanjski, "Smart Urban Mobility: Transport Planning in the Age of Big Data and Digital Twins", Elsevier Science Publishing Co Inc, 2022.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	-	3	2	-	-	2	2	-	3
CO2	2	2	1	-	3	1	-	-	2	1	1	2
CO3	3	3	2	2	2	2	2	1	1	2	1	1
CO4	1	1	1	-	3	2	-	-	3	2	1	2
CO5	2	2	2	1	1	-	1	-	3	2	-	3
CO6	3	2	3	1	3	1	-	-	2	1	-	3
Average	2	2	2	1	3	1	1	1	2	2	1	2

3- High 2-Moderate 1-Low

BN3020 URBAN RENEWAL AND HERITAGE CONSERVATION **L T P/S C**
3 0 0 3

OBJECTIVES

- To understand role, Concepts and Techniques of Urban Renewal and Conservation.
- To study Legal and Administrative Aspects of Urban Renewal and Conservation.
- To develop the ability of the students to identify the built forms, land parcels and historic neighborhoods for redevelopment.
- To equip students with the knowledge of various tools and techniques associated with urban renewal and heritage conservation.
- Explain the economic and spatial implication of urban renewal programmes.

UNIT I INTRODUCTION 9

Urban redevelopment / renewal /reconstruction / regeneration – definitions and distinctions; Urban redevelopment as a part of urban plan; Identification of areas to be redeveloped; Conservation, rehabilitation and redevelopment – the interrelationship.

UNIT II ECONOMIC, FINANCIAL AND MANAGEMENT ASPECTS 9

Economic and spatial implications of urban renewal programs; Mobilization of resources; Urban renewal through Incentive zoning.

UNIT III URBAN CONSERVATION AND DEVELOPMENT 9

Understanding the context of both built heritage and historic neighborhoods; Conservation: socio-economic and traffic management aspects; Redevelopment of brown fields; Heritage conservation - case studies.

UNIT IV HOUSING REDEVELOPMENT 9

Issues of old, dilapidated, vacant stock; Infrastructure inserts in old city area and augmentation of services; land management; FSI utilization and re-densification/dedensification issues; socio-economic issues; gentrification and de-gentrification; public participation; Convergence of government schemes.

UNIT V LEGAL AND ADMINISTRATIVE ASPECTS 9

Implementation of urban renewal programs – an overview of national and international experiences; Legal and administrative aspects: archaeological acts/ charters and institutional mechanism in urban redevelopment and conservation in India.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Understand and able to define urban renewal, redevelopment, regeneration, reconstruction, conservation and the distinction thereof.

- CO2** Appreciate both the tangible and intangible aspects of redevelopment and conservation.
- CO3** Identify the built forms, land parcels and historic neighbourhoods for renewal.
- CO4** Assess the form, extent and direction of planning interventions for renewal.
- CO5** Identify the notions of value and significance associated with cultural and natural heritage.
- CO6** Plot the components of heritage through case studies.

TEXT BOOKS

1. Andrao, D.Thomas,"Housing and Urban Renewal". George Allen and Unwin, Sydney, 1986.
2. D. Adams, "Urban Planning and Development Process in Renewal" (2001); UCL Press, London, 1994.
3. K. C. Sivaramakrishnan, "Re-visioning Indian Cities: The Urban Renewal Mission", Sage, 2011.
4. Chris Coch, Palgrave Macmillan, "Urban Renewal: Theory and Practice", Macmillan, London, 1990.
5. N. Balakrishna Reddy, "Urban Redevelopmen", Concept Publishing Company, 1996.

REFERENCES

1. Horita M. Koizumi .(Ed.), "Innovations in Collaborative Urban Regeneration", Springer, 2009.
2. Heritage and Urban Renewal, Intach, Aryan Books International, New Delhi, 2014.
3. Michael A. Pagano, "Cityscapes and Capital: The Politics of Urban Development", John Hopkins University Press, 1997.
4. Degen Monica Montserrat, "Sensing Cities: Regenerating Public Life in Barcelona and Manchester", Routledge, 2008.
5. Dilip kumar kushwaha, jagpal singh, "Basics of Heritage Conservation: A Handbook", Research India Press, 2020.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	3	2	2	2	1	2	1	2
CO2	3	3	2	1	2	3	3	2	3	3	1	3
CO3	3	1	3	-	3	-	1	-	2	1	2	3
CO4	3	-	2	-	3	2	-	1	3	1	3	3
CO5	2	3	3	2	3	-	1	-	2	3	2	2
CO6	3	3	2	-	1	3	2	-	3	3	3	3
Average	3	2	2	2	3	3	2	2	2	2	2	3

3- High 2-Moderate 1-Low

BN3021

TRANSPORT ECONOMICS

L T P/S C
3 0 0 3

OBJECTIVES

- To discuss the characteristics of transport infrastructure facilities, its growth trend and investment strategy.
- To discuss the various transport demand and supply techniques and the methods of forecasting the demand in the future.
- To infer the principle of pricing with respect to utilization of various transport infrastructure facilities as user pay principle and the role of subsidy.
- To estimate the various alternative financing mechanism available with respect to transport infrastructure development around the world.
- To infer the feasibility of a transportation planning project.

UNIT I	FINANCING TRANSPORT INFRASTRUCTURE	9
Characteristics of transport infrastructure, Growth trends, Investment need and budgetary support, existing financing pattern, financial recurrent expenditure.		
UNIT II	TRANSPORT DEMAND AND SUPPLY	9
Movement, transport and location, transport and economic development; Demand for transport, factors influencing demand; elasticity of demand, measures of elasticity; supply of transport, elasticity of supply; demand forecasting.		
UNIT III	COSTING AND PRICING OF TRANSPORT SERVICES	9
Fixed and variable cost, joint and common cost, cost allocation, user cost, internal cost, external cost, economic cost; Principle of pricing, marginal cost pricing, price discrimination, operational objectives of pricing; capital costs, operation and maintenance costs revenues, transport subsidies.		
UNIT IV	ALTERNATIVE FINANCING MECHANISMS	9
Multilateral and Bilateral Financing mechanism, Financial Institutions, Private sector participation, land as a resource, public private partnership, annuity based approach risk management, Investment strategy and phasing		
UNIT V	FEASIBILITY OF TRANSPORT PROJECTS	9
Concept of economic feasibility; estimation of economic costs- project cost, estimation of economic benefits- benefits to users, non-users , benefits to community and economy; Financial Internal Rate of Return (FIRR) , Economic Internal Rate of Return (EIRR), Net Present Value (NPV)		

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Infer the characteristics of transport infrastructure facilities, its growth trends and strategies.
- CO2** Discuss the various transport demand and supply techniques and the methods of forecasting the traffic demand for the future.
- CO3** Infer the principles of pricing of various transport infrastructure facilities as user pay principle and the role of subsidy given by the government.
- CO4** Estimate the various alternative financing mechanism available in the world with respect to transport infrastructure development.
- CO5** Discuss the financial and economic feasibility of a transportation planning project.
- CO6** Appraise the economic demand and financial requirements of a transportation planning project

TEXT BOOKS

1. Sarkar, P.K. and Maitri, V., Theory and Applications of Transport Economics in Highway and Transport Planning Standard Publisher 2010.
2. Papacostas, C.S. and Prevedours, Transportation Engineering and Planning Prentice Hall, 2001
3. Allen. F, Yago. G, Financing the Future, Market-Based Innovations for Growth, Pearson Publications, Indianapolis, Indiana, 2013.
4. Kenneth A. Small and Erik T. Verhoef, Urban Transportation Economics, 2nd Edition, Routledge, London, 2007.
5. A. Richard, Richard Hemming and H. Barry, The International Handbook of Public Financial Management Center for aid and public expenditure, Hamburg, Germany, 2013.

REFERENCES

1. Indian Road Congress, Manual of Economic Evaluation of Highway Projects IRC, 1989
2. Chakraborty, M. Estimating, Costing, Specification and Valuation of Civil Engineering 23rd Edition The New Book Depot **2010**
3. Telliford, G. Public – Private Transportation Partnerships around the World Nova Science Publishers 2009
4. Khan M.Y. and Jain, P.K. Financial Management 4th Edition Tata McGraw Hill
5. Karl E. Case Principles of Economics Pearson Education, 2009.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	1	3	3	1	1	1	1	2
CO2	3	2	2	3	2	3	3	1	1	1	2	2
CO3	2	2	1	3	2	3	2	1	1	1	3	3
CO4	3	1	2	2	1	3	2	1	1	1	3	3
CO5	3	3	2	3	2	3	3	1	1	1	3	3
CO6	3	2	2	3	2	3	3	1	1	1	3	3
Average	3	2	2	3	2	3	3	1	1	1	3	3

3- High 2-Moderate 1-Low

BN3022 ENVIRONMENTAL IMPACT ASSESSMENT **L T P/S C**
3 0 0 3

OBJECTIVES

- To understand the importance of Environmental Impact Assessment (EIA) in the planning process and its role in sustainable development.
- To examine the legal, policy, and regulatory requirements of EIA studies in India and gain insights into the global perspective of EIA.
- To familiarize with the step-by-step EIA process.
- To explore the various methods, tools, and techniques used in EIA
- To analyze the social impacts of development projects and the importance of social impact assessment

UNIT I ROLE OF EIA IN PLANNING **6**
Introduction to EIA, Need for EIA in planning, Legal policy and regulatory requirements of EIA studies in India; Global Perspective

UNIT II EIA PROCESS **6**
EIA Procedure - Establishing Baseline Conditions- screening – scoping - setting– analysis – mitigation -Types and limitations of EIA – Cross-sectoral issues, Planning of EIA studies, Guidelines and Terms of References for EIA.

UNIT III EIA METHODS- TOOLS AND TECHNIQUES **12**
Prediction and Assessment of Impacts- Phases of impact assessment, Various methods & techniques used in impact identification; Techniques used in impact prediction- Weighting, Scaling techniques, causal diagrams, Leopold Matrix, priority-trade off- Network- overlay; Impact Evaluation techniques- Cost- Benefit Analysis, Multi-Attribute Utility theory, DELPHI method, SDG IA Tool; Predicting Impact on the Physical Environment, Ecosystem, Biodiversity, and habitats, Cultural and Heritage process and impact assessment.

UNIT IV IMPACT ON SOCIO-ECONOMIC SYSTEM **12**
Definition of social impact assessment. Social impact assessment model and the planning process. Rationale and measurement for SIA variables. Relationship between socio-economic impacts and change in community and institutional arrangements. Public participation and involvement in EIA

UNIT V CASE STUDY **9**
EIA Case Examples- India and Global Perspectives; EIA Reporting and review; Documentation of EIA findings - Evaluation of Alternatives & Decision making for the Preferred Alternative, Structuring and Writing an EIA report.

TOTAL: 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Analyze the role and importance of Environmental Impact Assessment (EIA) in planning
- CO2** Evaluate the operation of EIA in India and other countries
- CO3** Apply the EIA process by effectively establishing baseline conditions and employing appropriate analysis strategies.
- CO4** Understand various methods and tools of impact assessment
- CO5** Assess the socio-economic impacts of development projects through the measurement of SIA variables,
- CO6** Analyze EIA case examples from India and global perspectives

TEXT BOOKS

1. Nick Harvey, Beverley Clarke, Environmental Impact Assessment: Procedures and Practices, Oxford University Press, USA, 2012.
2. Anjaneyulu Y., Manickam Valli, "Environmental Impact Assessment Methodologies", BS Publications, Third Edition, 2023
3. Lawrence, D.P., Environmental Impact Assessment – Practical solutions to recurrent problems, Wiley-Interscience, New Jersey, 2003
4. Shrivastava A.K., Baxter Nicola, Grimm Jacob, "Environmental Impact Assessment", APH Publishers, 2003
5. Marriott B., "Environmental Impact Assessment: A Practical Guide", McGraw-Hill Publication, 1997

REFERENCES

1. Petts, J., Handbook of Environmental Impact Assessment, Vol., I and II, Blackwell Science, London, 1999
2. Yadav, Dr Vikrant, Environmental Impact Assessment: A Critique on Indian Law and Practices, International Journal of Multidisciplinary Research and Development, Volume 5; Issue 1; January 2018; Page No. 01-05, 2018
3. Alomoto, W., Niñerola, A. & Pié, L. Social Impact Assessment: A Systematic Review of Literature. Soc Indic Res 161, 225–250 <https://doi.org/10.1007/s11205-021-02809-1>, 2022

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					3	3					2
CO2	3				1	3	3	2			1	2
CO3	3	2	1	1	2	3	3	2		3	2	2
CO4	3	2	1	1	1	3	3	2	2	3	2	3
CO5	3	2	2	2	2	3	3	2	2	2	2	3
CO6	3	2	2	2	1	3	3	2	2	3	2	3
Average	3	2	2	2	1	3	3	2	2	3	2	3

3- High 2-Moderate 1-Low

BN3023

DRONE MAPPING FOR URBAN APPLICATION

L T P/S C
1 0 4 3

OBJECTIVES

- To understand the basics of drone concepts.
- To impart the knowledge of and flying and operation of drone
- To understand the different mapping and modelling techniques
- To understand about the image processing applications for drone images.
- To know about the various applications of drone.

UNIT I	INTRODUCTION TO UAV	15
UAV: Definition and history, Difference between aircraft and UAV, DGCA classification of UAV's, Types and Characteristic of Drones, fixed, multi-rotor, flapping wings, existing Regulation in UAV Operations.		
UNIT II	DRONE FLYING AND OPERATION	15
Concept of operation for drone, Flight modes- Operation of small drone in a controlled environment Drone controls Flight operations, management tool, Sensors-Onboard storage capacity, Removable storage devices- Planning for Image Collection, decision on position angle of camera for image collection, decision on altitude of drone based on operation		
UNIT III	MAPPING AND MODELING	15
Introduction to mapping and modeling concepts, Understanding RTK, PPK and GCP's, Overview of popular data processing software platforms and functions.		
UNIT IV	IMAGE PROCESSING AND PHOTOGRAMMETRY	15
Aerial Triangulation, post processing software's, Analyzing Data, Orthomosaic Maps, 3D Point Cloud, Digital Surface Models (DSM), Digital Terrain Models (DTM)- Contour Maps-3D textured mesh, cut, fill and Volumetric Measurement Calculation and orthophoto generation.		
UNIT V	APPLICATIONS	15
Application of Drone Images in Different sectors, use of drone image in urban planning, extraction of data from drone images and its uses in urban planning, Linked mobile devices and applications.		

TOTAL : 75 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Explain about the about a various type of drone technology.
- CO2** Plan to execute the suitable operating procedures for functioning a drone.
- CO3** Choose appropriate sensors and actuators for Drones.
- CO4** Classify different mapping and modeling
- CO5** Choose appropriate image processing and photogrammetry software for processing.
- CO6** Formulate procedure to use drone image in urban planning issues.

TEXT BOOKS

1. Daniel Tal and John Altschuld, "Drone Technology in Architecture, Engineering and Construction: A Strategic Guide to Unmanned Aerial Vehicle Operation and Implementation", John Wiley & Sons, Inc, 2021.
2. Završnik, "Drones and Unmanned Aerial Systems: Legal and Social Implications for Security and Surveillance", Springer, 2018.
3. Amy Frazier, Kunwar Singh , "Fundamentals of Capturing and Processing Drone Imagery and Data", CRC Press, 2021.
4. Paul Cureton, "Drone Futures: UAS in Landscape and Urban Design" Routledge, 2020.
5. Garvit Pandya, "Basics of Unmanned Aerial Vehicles: Time to start working on Drone Technology", Notion press, 2021.

REFERENCES

1. Daniel Tal, Jon Altschuld, "Drone Technology in Architecture, Engineering and Construction: A Strategic Guide to Unmanned Aerial Vehicle Operation and Implementation, Wiley, 2021.
2. Quan Shao, Jiaming Li, "Study of Urban Logistics Drone Path Planning Model Incorporating Service Benefit and Risk Cost", Drones, 2022.
3. David Gallacher, "Drone Applications for Environmental Management in Urban Spaces: A Review", International Journal of Sustainable Land Use and Urban Planning, 2016.
4. Jake Nelson R, Tony Grubestic H,"UAV and Urban Spatial Analysis: An Introduction", Springer Nature Swizerland AG, 2021.
5. Alexandros Skondras, " UAV Mapping and 3D Modeling as a Tool for Promotion and Management of the Urban Space", Drones, 2022.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1	-	3	2	-	-	2	2	-	3
CO2	2	2	1	-	3	1	-	-	2	1	1	2
CO3	3	3	2	2	2	2	2	1	1	2	1	3
CO4	1	1	1	-	3	2	-	-	3	2	1	2
CO5	1	1	2	1	3	-	-	-	3	2	-	3
CO6	3	2	3	1	3	1	-	-	2	1	-	3
Average	2	2	2	1	3	1	2	1	2	2	1	3

3- High 2-Moderate 1-Low

BN3024

FUTURE CITIES

L T P/S C
3 0 0 3

OBJECTIVES

- To enable students aware and expose to changing scenario in the spatial order of cities and regions as well as the emergence of virtual societies in the World
- To understand the impacts of various trends/factors that lead to the development of future cities.
- To enable the students to understand the use and power of emerging new technologies and social networks among communities across the city, country and globe
- To provide information on current changes in city management aimed at ensuring better effectiveness and citizen's engagement.
- To recognize factors determining quality of life and the use of city space with the ambition to inspire students to contribute to making cities a better place to live.

UNIT I CITY AS AN ORGANISM – PLANNING AND TECHNOLOGY 9

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. City as the most complex human-made organism, Social and urban planning issues like public health, transportation, zoning, gentrification, cost of living, crime, and congestion.

UNIT II CITY DYNAMICS -TECHNOLOGY-INFRASTRUCTURE 9

Understand a city's people, components, functions, scales and dynamics, as precondition for its sustainable design and management. Transportation and technology, water, sanitation and technology, energy efficient technology for home, street, neighborhoods and city, telecommunication, health and education, security and safety for buildings and people in cities.

UNIT III DIGITAL CITIES - URBAN ENERGY SYSTEMS 9

Digital cities, virtual cities, technology parks, smart planning and infill development; Planning, design and communication system, socio-economic and environmental impact of Techno Cities. Systems and hierarchy, Communication networks, Macro versus micro grid, Renewable sources of energy in India, Energy policy; National missions - Solar and enhanced energy efficiency.

UNIT IV DISPARITIES AND EQUAL OPPURTUNITIES - GOVERNANCE 9

Future of urbanization, Critique of neo-liberalism; power and hegemony; forms of marginalization; right to the city approach; Caste and religion –planning and designing for the differently-able persons, elderly, children, and pregnant women. Role of law and technology, administration and organization, industry and corporate, communities and people in building smart cities and smart communities, participatory planning.

UNIT V EMERGING TRENDS 9

Emerging school of thoughts and doctrines, Contemporary contributions to the changing planning paradigms; Planning for future and in future - vision development, strategizing, Implementation of planning policies and development plans, Toolkits, indexes and models developed to measure futuristic cities.

TOTAL : 45 PERIODS**COURSE OUTCOMES**

Course Outcomes: Upon the completion of this course, the students would be able to:

- CO1** Familiarize students with future city visions, roles, functions and the main opportunities and challenges facing cities.
- CO2** To analyze city functioning and development by combining the economic, social, environmental, spatial and governance aspects.
- CO3** Demonstrate familiarity about paradigm shift in the spatial planning outlook and governance edge.
- CO4** Relate to a city in terms of theorizing cities through the lens of futurism.
- CO5** Infer from various policies and programmes concerned to future development.
- CO6** Categorize from various perspectives of planning special context to the future cities.

TEXT BOOKS

1. Deakin, Mark; Al Waer, Husam, "From Intelligent to Smart Cities", Routledge, 2012.
2. Manuel Pedro Rodríguez-Bolíva, "Transforming City Governments for Successful Smart Cities", Springer International Publishing Switzerland, 2015.
3. Stan Geertman, Joseph Ferreira, Jr., Robert Goodspeed, John Stillwell, "Planning Support Systems and Smart Cities", Springer International Publishing Switzerland, 2015.
4. Tridib Banerjee, Anastasia Loukaitou-Sideris, Editors, 'Companion to Urban Design', Routledge, 2014.
5. Walter Benjamin, 'The Work of Art in the Age of Mechanical Reproduction', in Illuminations, Schocken Books, New York, 1969

REFERENCES

1. Roger L. Kemp, Carl J. Stephani, "Global Models of Urban Planning: Best Practices Outside the United States", McFarland, USA, 213.
2. Intelligent Community Forum, "Innovation and Employment in the Intelligent Community", Intelligent Community Forum, pp1-35, 2012.
3. Komakech, D, Achieving More Intelligent Cities, Municipal Engineer, pp259-264. 2005.
4. Nohrstedt, "Digital Planning: Integrating New Information and Communication Technologies in Urban Planning", 2012
5. Brkovic, M. B. "Planning in the Information Age: Opportunities and Challenges of E-Planning", 2004.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3	2	1	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	1	3	3	2	1	3
CO3	3	1	3	3	2	2	2	3	3	1	1	3
CO4	2	3	2	2	3	3	2	3	2	2	1	2
CO5	3	3	3	3	3	3	2	2	2	2	1	3
CO6	3	3	3	3	3	2	3	2	1	2	1	3
Average	3	3	3	3	2	3	2	3	2	2	1	3

3- High 2-Moderate 1-Low

OPEN ELECTIVE COURSES

OBN351	PLANNING AND MANAGEMENT OF GREEN AND OPEN SPACES	L	T	P/S	C
		3	0	0	3

OBJECTIVES

- To understand Open Spaces as a critical element of value in planning.
- To impart open space planning methodologies through case studies.
- To demonstrate the ability to plan green urban structure.
- To create an awareness of the decisive influence of planning green open spaces on the living environment.
- To analyze what makes a public space part of sustainable urban green space.

UNIT I ELEMENTS OF OPEN AND GREEN SPACES 9

Green & Open spaces as an outcome of natural processes – Principles and techniques of design with landform, water and vegetation – role of surface materials – outdoor fittings and structures – open space and landscape elements – Man-made landscapes in history – comparative study of major traditions of landscape planning in relation to concepts of space and the use of landscape elements.

UNIT II URBAN OPEN SPACES 9

Characteristics and components of open space patterns in town and cities (traditional and contemporary) – basic types: streets, squares, plazas, gardens, ghats and maidan, public parks at district, local and neighborhood levels – park system – circulation networks and activity – street furniture as a component of urban landscape.

UNIT III URBAN GREEN SPACES 9

Design with nature concept – principles of understanding and evaluation of existing landscape – land suitability analysis – concept of landscape and urban green space for site planning and recreation – role of vegetation – environmental benefits, functional requirements, aesthetic considerations.

UNIT IV SPORT AND PLAY FIELDS 9

Multipurpose open spaces/maidan – contested spaces – hierarchy and standards for sports and play fields – role of public/private institutions.

UNIT V MANAGING OPEN SPACES 9

Open spaces in master plans – role of government and NGO, Community participation – legal measures for managing open spaces – parks and play grounds – case studies.

TOTAL : 45 PERIODS

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Discover knowledge in urban open spaces and value of green environment.
- CO2** Recognize and understand the functions of open space and its activities.
- CO3** Understand the significance of urban green spaces and its management.
- CO4** Identify the causes, effects and implications of promoting green and open spaces to the society.
- CO5** Apply the principles of making green and open spaces in an urban environment.
- CO6** Recognize different forms of green and open spaces and apply them for sustainable environment and social development.

TEXT BOOKS

1. Clare, Copper Marcus and Carolyn Francis, "Environmental Studies", Tata Mc Graw Hill Publishing Co. Ltd, New Delhi, 1st Edition, 2006.
2. Marsh W, "Landscape Planning", Wiley Danvers, 2010.
3. Mark Francis, "Urban Open Space: Designing for User needs", Island Press, 2003.
4. Plummer, Brian, "City Gardens: An open spaces survey in the City of London", Belhaven Press, 1992.
5. Byrom, John.A, "Greener Greater Edinburgh", Cockburn Association, 2002.

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1. Government of India, "Master Plan for Delhi – 2021", Delhi Development Authority, Ministry of Urban Development, New Delhi, 2021.
2. Government of India, "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines, Vol I&II, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2015.
3. Government of India, "Urban Greening Guidelines 2014, Town and Country Planning Organisation, Ministry of Urban Development, New Delhi, 2014.
4. Luca Battisti, Federica Larcher and Marco Devecchi, "Urban green management plan: Guidelines for European Cities", Front.Hortic,2023.
5. Dempsey N Smith, "Understanding place-keeping of open space", Routledge, 2014.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2		3	2	3	1	2	1	3
CO2	3	2	1	1		2	3	3	2	2	1	3
CO3	2	2	3	2	2	2	3	3	1	3	2	2
CO4	3	2	3	3	1	2	3	3	1	1	2	3
CO5	2	1	3	1	2	3	2	2	1	1	3	1
CO6	1	3	3	1		1	2	2	1	1	1	2
Average	2	2	2	2	2	2	3	3	1	2	2	2

3- High 2-Moderate 1-Low

OBN352

TOURISM PLANNING AND DEVELOPMENT

L T P/S C
3 0 0 3

OBJECTIVES

- To understand the fundamental concepts and key determinants of tourism
- To explore the impacts of tourism on urban development, the environment, and local social and economic development.
- To familiarize with the planning processes and components involved in tourism projects
- To familiarize with the importance of tourism infrastructure and their role in supporting tourism development.
- To examine tourism policies at the state and national levels

UNIT I INTRODUCTION TO TOURISM

9

Definitions, scope, nature, types, key determinants and characteristics of tourism; tourism hubs; tourism as an industry; growth of tourism in developed and developing world; problems and issues of tourism; sociology of tourism- leisure, recreation, travel and tourism.

UNIT II TOURISM SECTOR- IMPACTS

9

Relationship between tourism and urban development; Tourism and environment; Tourism multiplier and forecasting methods; capacity building and carrying capacity; planning for tourism projects; cultural and social aspects, Eco- Tourism and local social and economic development; case studies

UNIT III PLANNING FOR TOURISM

9

Tourism plans,- plan components; social and spatial planning of origin- transit – destination planning; Role of multiple government authorities and agencies involved in tourism development; Tourism circuits- planning and development of region; case- studies.

UNIT IV TOURISM INFRASTRUCTURE

9

Need for infrastructure support planning such as accommodation, transportation, water supply, solid waste disposal, health, safety and information system; Revenue streams and resources.

UNIT V TOURISM POLICIES AND PROGRAMS

9

Tourism policies at the state and national level; Government and community interventions to develop tourism sector.

COURSE OUTCOMES

Course Outcomes: Upon the completion of this course, the students would be able:

- CO1** Understand tourism and its various types and characteristics
- CO2** Evaluate the impacts of tourism on urban development, the environment, and socio-economic development
- CO3** Analyze the tourism projects considering social and spatial factors and involving multiple government authorities and agencies
- CO4** Assess the importance of tourism infrastructure and its role in supporting tourism development
- CO5** Evaluate tourism policies at the state and national levels and their impact on the tourism sector
- CO6** Analyze case examples that foster the growth and development of the tourism sector from India and global perspectives.

TEXT BOOKS

1. Andrew Holden, 'Tourism, Poverty and Development, Routledge,' London 2013.
1. Bhatia A.K., 'Tourism Development-Principles and Practice,' Sterling Publishers, New Delhi, 1982.
2. David J. Telfer, 'Richard Sharpley, Tourism and development in the developing World,' Routledge, 2008.
3. David L. Edgell, 'Tourism Policy and Planning,' Routledge, London, 2013.
4. Edgell D, 'Tourism policy and planning: yesterday, today and tomorrow,' Routledge, 2008.

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1. Glare A. Gunn, 'Tourism Planning-Basics, Concepts, Cases,' Taylor & Francis, London, 1994.
2. Manuel Baud Bouy, 'Tourism and Recreation Development,' Architecture Press, London, 1977.
3. Noel Scott and Eric, 'Laws, Safety and Security in Tourism,' Routledge, London, 2013.
4. Peter Mason, 'Tourism Impacts, Planning and Management,' Routledge, 2012.

CO-PO Mapping

Course Outcome	Program Outcome											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3					3	3					2
CO2	3				1	3	3	2			2	2
CO3	3	2	2	1	2	3	3	2		3	2	2
CO4	3	2	2	1	1	3	3	2	2	3	2	3
CO5	3	2	2	2	2	3	3	2	2	2	2	3
CO6	3	2	2	2	1	3	3	2	2	3	2	3
Average	3	2	2	2	1	3	3	2	2	3	2	3

3- High 2-Moderate 1-Low