MODEL CURRICULUM FOR FIVE-YEAR INTEGRATED PROGRAMME IN PLANNING

- M.Plan/M.Tech (FYIP) in Planning (After completing 5 Years)
- B.Plan/B.Tech. in Planning (Exit after 4 Years)
- Diploma in Planning (Exit after 2 Years)

Plan of Houses & Streets, Mohanjo- Daro

Reconstructed Image of Mohanjo- Daro

Submitted by

Expert Committee of ITPI on NEP 2020 & Planning Education

INSTITUTE OF TOWN PLANNERS INDIA
4-A, INDRAPRASTHA ESTATE, NEW DELHI

Model Curriculum for Five Year Integrated Programme in Planning

- **M.Plan/M.Tech (FYIP) in Planning**
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INSTITUTE OF TOWN PLANNERS, INDIA
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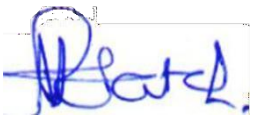
From President's Desk

India is on the cusp of transformation, especially in urban and rural areas. India has positioned itself globally in the economy and in various dimensions. The 'Strategy for India @ 75', suggested by NITI Aayog is 'an attempt to bring innovation, technology, enterprise and efficient management' for the collective effort of India's billion plus population for its US $4 trillion economy in 2075. This necessitates reimagining our educational capacity to be more innovative and efficient to equip our workforce to reach this target. Institute of Town Planners, India, New Delhi (ITPI), since its inception in 1951, has been aligning with the national goal and objectives, especially in the field of spatial planning, and for the overall development of the country.

Since the introduction of the National Educational Policy (NEP) by the Government of India, in 2020 and subsequent National Higher Education Qualification Framework (NHEQF) in 2023, ITPI is making its efforts to redefine and realign the planning courses at under-graduate and post-graduate levels on the lines of these policy of the Government of India (GoI). In 2012 and in 2022, AICTE, GoI brought in changes in Town Planning Education through its Town Planning Board. However, with the introduction of NEP 2020, NHEQF 2023, and NITI Aayog's recommendations (Reforms in Urban Planning Capacity in India-2021), ITPI through its Council felt that these policies are essential for Indian Town Planning Programme being offered by the Central/State/ Deemed/ Private /Denovo Deemed to be Universities, and needs to be adapted by ITPI and its member institutions. ITPI constituted another Eight Member Expert Committee on July 20, 2024 to incorporate UGC, NEP, NHEQF, and NITI Aayog guidelines and suggestions in the existing M.Plan/M.Tech in Planning Programmes and to suggest new programmes in line with the NITI Aayog reports and other latest policies to equip India for 2075 to higher levels of development. The Committee deliberated on various programmes and submitted its report to ITPI, which was approved by its Council with few suggestions in its meeting held on September 26, 2024 at Vijayawada, Andhra Pradesh.

ITPI thank the committed Committee Members who had worked hard to bring out this report within a given time frame. We thank all other experts who supported through their suggestions and deliberations to make this report possible. We hope this report will be useful for all the Academic Institutions associated with ITPI and affiliated with UGC and AICTE, Government of India. We are confident that with th*ese* realigned and relaunched programmes, the planning student community will bring change to make a 'New India 2047' in the field of urban and rural areas of India.



(N.K. Patel)

From Chairman's Desk

National Educational Policy (2020) brought out new vistas in the field of higher education and states that 'higher education can contribute the sustainable livelihoods and economic development of the nation'. Considering that India is steered by majority of the youth population, which propel the urbanisation and the economy, it is essential that the rapid transformation of the economy and urbanisation is managed through a proper planning process. Institute of Town Planners, India (ITPI), established as a leading institution in 1951 under the Companies Act, has been shaping the spatial planning in India not only in urban but also in rural areas. It has been instrumental in facilitating major spatial policies such as First Urbanisation Policy in India, Western Ghats and Eastern Ghats Planning Area, National Capital Regional Plan, Delhi Development Plan, and Spatial Plans in many of the Union Territories. Urban and rural development being the State Government's subject under the Constitution of India, the influence of ITPI in shaping the national and at the state level spatial policies, over a period of time is evident through the contribution of Town and Country Planners across India. ITPI has 23 regional chapters and 5 regional centres efficiently operated through its members, who are heading some of the Town and Country Planning, Urban Development Departments, Development Authorities, and Academic Institutions other private companies. More than 80 institutions across India impart planning education to improve the capacity of the youth and train them to handle the challenges of urban, rural and regional planning.

The language of planning in India, especially spatial planning, is unique and historic. No other country in the world is so rich in its planning culture and variation. India is pioneer in the field of multitude of languages intricately linked to cultural heritage and planning. From the Harappan and Gangetic civilization planning, to Cholas and Pandiyas, Deccan Kingdoms to Northern planned cities such as Jaipur, to modernized cities such as Gandhinagar, Chandigarh, Bhubaneswar, NOIDA and New Mumbai, the planners of India have made key contributions in shaping them. From this past, India is moving towards the third largest economy in the world, and it is expected that almost 50 percent of its population will be living in urban areas by the 100th Year of India's Independence i.e. by 2047. NITI Aayog (2022) has opined that 'Urbanisation is not only a consequence of faster growth but also an instrument for promoting development through the economies of agglomeration which characterize the cities'. It is not only the plans of urban and rural areas, which are being prepared by the Planners, but there are other stakeholders and implementers who influence the plan implementation process in the country. Hence, planning by itself is a multi-disciplinary subject. Considering this, ITPI, from the beginning, has proposed the planning programmes in various education institutions open to various disciplines, which is like MERU (2040) suggested by NEP (2020). In addition, ITPI has been conducting capacity building programmes for the planners at different levels through offline and online modes.

NEP 2020, NHEQF 2023, and NITI Aayog's recommendations (Reforms in Urban Planning Capacity in India-2021) are eye openesr to new avenues to incorporate more multi-disciplinary subjects to planning, such as use of Artificial Intelligence (AI) and Machine Learning (ML), Climate Change, Public Policy, etc. Implementing their guidelines is a challenge for ITPI to come out with programmes offering diploma and degrees at different levels, which can be taken up by the Governments across India, and also by private sector for the recruitment of trained professionals. It is assumed that a quick fix to urban and rural issues through these diplomas

and degrees will not only suffice to address the ground realities, but will help various stakeholders to understand the planning profession as well.

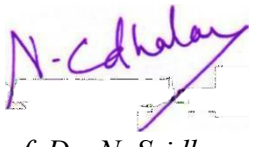
ITPI set up a Six Member Committee on January 1, 2023 to propose a framework for B.Plan-M.Plan/B.Tech-M.Tech Five Year Integrated Programme (FYIP) in planning as per NEP 2020 guidelines. The Committee deliberated on different aspects of the NEP 2020 and submitted its proposed framework of FYIP to ITPI, which was approved in the Extra General Body Meeting of ITPI held on February 24, 2023 in Bhubaneshwar.

Realising further developments in the spatial planning discipline, ITPI constituted another Eight Member Expert Committee on July 20, 2024 to incorporate UGC, NEP, NHEQF, and NITI Aayog guidelines and suggestions in the existing B.Plan/B.Tech and M.Plan/M.Tech in Spatial Planning Programmes. Need was also felt to propose New Innovative Programmes in line with the NITI Aayog reports and other latest policies to equip India for higher levels of development by 2075. The Committee deliberated on various aspects of the NEP 2020, NHEQF 2023, and NITI Aayog guidelines, and programmes being run across the globe and submitted its report to ITPI. The Committee refurbished the existing seven specialized 2-year post-graduate programmes and proposed three new innovative (2-year standalone) post-graduate programmes in spatial planning stream. The Committee presented its report before the Council of ITPI in its meeting held on September 26, 2024 at Vijayawada, Andhra Pradesh, where the efforts of the Committee were appreciated. The suggestions of the Council were incorporated and the framework for M.Plan/M.Tech (2-year standalone) programmes in spatial planning disciplines and detailed course curriculum for M.Plan/M.Tech. were submitted to the ITPI on October 27, 2024.

ITPI is part of the Commonwealth Association of Planners', and many of our member Institutions such as IIT-Kharagpur, SPAs are linked to International Universities and Institutions for their programmes. It is proposed to encourage all the ITPI recognized Planning Institutions of India to link with these international universities in the field of planning and allied courses, so that planning in India is enriched through their knowledge transfer at different levels.

The policy document also suggests mechanism to integrate planning at school level so that the future of spatial planning is shaped by the youth of the country.

The members of this Committee thank ITPI for entrusting the responsibility to this team to prepare the 'Policy Document' to steer the Planning Education in line with the NEP (2020) and UGC (2022) guidelines. This document is just a beginning to propose contemporary, innovative, and state-of-the-art multi-disciplinary PG programmes in the field of planning. We at ITPI thank the Ministry of Education, Government of India for steering new avenues in the field of education at all levels with a new thinking.



(Prof. Dr. N. Sridharan)

Preface

India's population has been increasing tremendously along with its economic growth and per-capita income. There is evidence across the world showing that increasing urbanization pushes the economic development. Urbanization rate has been increasing especially through in-situ development, where many of the big villages – census towns, are pushing the urbanization to higher levels along with metropolitan cities. It is estimated by several research reports such as UN, The World Economic Forum, Census of India, etc., that India's urbanization will reach more than 55 percent in 2050. The Indian Government has an agenda of achieving a GDP of four trillion US dollar by 75th year of Independence. This poses a challenge in various sectors for which we need to re-engineer the existing system through innovation, especially in the education sector.

In this direction, the Government of India came up with the National Education Policy (NEP) in 2020, which was later followed by the National Higher Qualification Education Framework (NHQEF) in 2023 to equip the Indian population to be ready for a VIKSIT Bharat by 2047. Thanks to the guidance of the NEP and NHQEF, which are adapted by various academic institutions at all levels since 2020. ITPI, as a part of its commitment to align with the National Priorities, set up a Six Member Committee on January 20, 2023 to propose a under-graduate Five Year Integrated Programme in line with the guidelines of NEP 2020. The Committee's report was presented and approved in the Extra General Body meeting held on February 24, 2023 at Bhubaneshwar. On July 20, 2024, ITPI reconstituted Eight Member Expert Committee to re-assess the existing under-graduate and post-graduate programmes and to innovate new programmes at post-graduate Level. The Committee supported by the President of ITPI, Secretary General and Coordinator (Admin-Legal) of ITPI had eight sittings and deliberated for more than 200 person hours during this period. The Committee consulted the subject experts during the meetings, and held consultations with them to finalize the outline scheme and detailed course curriculum for ten programmes, including existing and newly proposed.

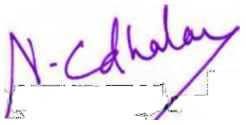
This report adhered to the NEP and the NHEQF guidelines and possess the following salient features for the PG programmes.

- New subject areas at UG or PG levels such as Civil Engineering, Environmental Engineering, Computer Science, Structural Engineering, Urban Design, Bachelor's in Law (5-year programme only), Econometrics, Social Work, Statistics, Operation Research, Remote Sensing and Geographic Information System, Public Administration, Geoinformatics, Management, Governance, Public Policy may be opened for entry to the PG Programmes in Planning.
- New Master's Programmes i.e. Real Estate Management, Spatial Governance and Policy, and Spatial Data Information System are introduced with the existing seven programmes.
- A plethora of electives and options are opened-up enabling the students to select innovative set of courses across various programmes.
- As per the NEP/NHQEF, vocational training, value addition education and multi-disciplinary courses are made mandatory for all the programmes.
- The first semester, with its basic planning courses, has been made compulsory for all the ten programmes.
- In each of the Master's programme, studio hours have been incorporated which gives a practical knowledge through field work.

- Each programme has a part of legislation, governance, finance, etc. which are necessary in the plan preparation, funding, implementation, and evaluation.
- The domain expertise has been kept intact for each Master's Programme supported by allied disciplines.
- In the academic field, especially in the field of planning, the canvas and the landscape is everchanging and evolving. Hence, courses that are designed for each programme may be revisited and revised periodically in tune with the environment at that time. The courses for each programme are not an end but a beginning for a new India and therefore, should be explored further.

The Committee members would like to place on record their gratitude to the President, Secretary, Co-Ordinator (admin-legal), and all the external experts for the inputs, cooperation, and positive support in the whole process. We thank, the Research Associates - Sh. Damandeep Singh and Sh. Sameer Talwar for their sincere help and commitment for the cause. We thank the ITPI administration for taking care of the Committee members' hospitality, and boarding and lodging.

(Ashwani Luthra)
Member Secretary
NEP-ITPI Committee



(N. Sridharan)
Chairperson
NEP-ITPI Committee

Members of the ITPI Committee for Proposing
ORIENTING PLANNING EDUCATION IN LINE WITH NEP 2020 GUIDELINES
(Constituted on January 20, 2023)

Sr. No.	Name	
1	Prof. Dr. N. Sridharan	Chairman
2	Prof. Dr. Ashwani Luthra	Secretary
3	Prof. Dr. Sanjay Gupta	Member
4	Prof. Dr. Manmohan Kapshe	Member
4	Prof. Dr. Pratap Raval	Member
6	Sh. Pradeep Kapoor	Member
7	Sh. P. N. Rajesh	Member

Members of the ITPI Committee for Proposing
ORIENTING PLANNING EDUCATION IN LINE WITH
NEP 2020, NHEQF 2023, AND NITI AYOG GUIDELINES
(Constituted on JULY 20, 2024)

- Prof. Dr. N. Sridharan (Chairperson)
- Prof. Dr. Ashwani Luthra (Secretary)
- Prof. Dr. Sanjay Gupta (Member)
- Prof. Dr. K.K. Dhote (Member)
- Prof. Dr. Firoz Mohammed (Member)
- Dr. Anjula Negi (Member)
- Sh. Pradeep Kapoor (Member), Co-ordinator (Techno-Admin), ITPI
- Sh. V. P. Kulshrestha (Member), Secretary General, ITPI

Special Invitees for Various Programmes

- Sh. N.K. Patel
- Prof. Dr. Natraj Kranthi
- Prof. Dr. Adi Narayane
- Dr. Sheuli Mitra
- Dr. Ruchita Gupta
- Prof. Dr. Gayathri Aadityaa

Experts who contributed or discussed on individual basis

- Sh. Shubham Mishra – Visiting Faculty, SPA Delhi
- Sh. Vipul Parmar – IIT, Mumbai
- Dr. Arindam Biswas – IIT, Roorkee
- Prof. Dr. Rajshree Kotharkar, VNIT, Nagpur
- Prof. Prem Pangotra, Ex- IIM, Ahmedabad
- Prof. Sahoo, IIM, Bangaluru,
- Prof. Dr. Bhuvaneswari Raman - Jindal University, Sonipat
- Dr. Sony Pellissery—National Law University, Bengaluru
- Dr. Anthony De Sa – Ex-Chief Secretary, & RERA Chair, Madhya Pradesh

Research Associates

- Sh. Damandeep Singh - ITPI, New Delhi
- Sh. Sameer Talwar – ITPI, New Delhi

MEETINGS DATES AND OUTCOMES

Meeting Number	Date of the Meeting	Hours Deliberated	Outcomes
1	January 27, 2023	2	Understanding the UGC Guidelines and Challenges for Developing a Framework for Five Year Integrated PG Programme in Planning
2	February 03, 2023	4	Deliberations on the Structure of Five-Year Integrated PG Programme in Planning
3	February 12, 2023	4	Preparing Draft Report on the Framework of Five-Year Integrated PG Programme in Planning
4	April 19, 2023	5	Finalizing the Draft Framework for Five Year Integrated PG Programme in Planning and Presenting it at Extra General Body Meeting on February 24, 2023 at the 71st NTCP conference of ITPI for Comments and Suggestions
5	April 29, 2023	3	Incorporating the Suggestions of the ITPI Members and Planning Institutes in the Report on Framework for Five Year Integrated PG Programme in Planning from the Extra General Body Meeting at the 71st NTCP conference of ITPI
6	June 17, 2023	4	Finalizing the Report on Five Year Integrated PG Programme in Planning and Submitting to ITPI.
Reconstituted Committee			
1	July 20, 2024	3	Scanning of Various Existing Programmes & New Programme Ideas
2	July, 27 2024	4	M.Plan/ M.Tech Five-Year Integrated Planning
3	August, 3 2024	4	M.Plan/ M.Tech Five-Year Integrated Planning and M.Plan/ M.Tech New Programmes
4	August 10, 2024	4	Framework for Existing and New Programmes - Deliberation
6	August 24, 2024	5	Framework for Existing and New Programmes – Deliberations and Finalization
7	September 6-7, 2024	5	Framework For Existing and Existing and New Programmes – Refining and Approval
8	September 14, 2024	2	Refining Existing and New Programmes Approval
9	October 5-6, 2024	5	Refining all Programmes as per ITPI Council suggestions
10	October 27, 2024	3	Submission of the Report
11	May 31, 2025	6	Deliberations and suggestions with various Planning Institutions across India
12	June 15, 2025	4	Deliberations on the AICTE Town Planning Board's suggestions on the courses.
13	June 22, 2025	3	Preparations for the inclusion of the suggestions of AICTE Town Planning Board in the FYIP and Two-Year PG Programmes
14	June 29, 2025	5	Inclusion and finalization of the suggestions of AICTE Town Planning Board in the FYIP and Two-Year PG Programmes

SECTION – I

BACKGROUND AND DETAILS OF PROPOSALS FOR FIVE-YEAR INTEGRATED PROGRAMME IN PLANNING

1.1. PRELUDE

The human settlements are experiencing rapid transformations due to the changing socio-economic paradigms, advancements in digital technologies, pandemic conditions, and other challenges faced by them. Rapid urbanization, climate change, ecological imbalances, spatial irrationalities, socio-cultural complications, economic instabilities, environmental disturbances, housing deficiencies, transportation challenges, water supply and sanitary crisis, etc. ask for innovative, advanced, constructive, futuristic spatial planning paradigms to build productive, inclusive, resilient, and sustainable human settlements. Sustainable Development Goals (SDGs) address these concerns and have set the targets to achieve them by 2030. The key to achieve these goals and targets is to impart systematic education and advanced knowledge to produce trained manpower to handle the upcoming challenges. India being a signatory is committed to achieve the SDG-4, which seeks to 'ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'.

While addressing the dramatic scientific and technological advances, such as the rise of big data, machine learning, and artificial intelligence, the NEP, 2020 envisages the increasing need for skilled workforce having multi-disciplinary abilities. NEP advocates to move towards critical training and use multi-disciplinary, innovative ways of solving solutions.

The Policy intends to create vibrant multi-disciplinary environments in academics and research, high quality teaching and community engagements. It proposes to have

- Imaginative and flexible curricular structure – novel and engaging course options;
- Multiple entry and exit points through academic bank of credits (7 years);
- Innovative Research-based specialization;
- Academia-government-industry linkage;
- Pedagogical reforms - communication, discussion, debate, research, and opportunities for cross- disciplinary and interdisciplinary thinking;
- Value-based education; and
- Industrial Internships and Research Internships.

The Policy proposes that the pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centered, discussion-based, flexible, and, of course, enjoyable. Education must build character, enable learners to be ethical, rational, compassionate, and caring, while at the same time prepare them for gainful, fulfilling employment'. The Policy proposes the revision and revamping of all aspects of the education structure through paradigm shift from behaviourism to cognitivism, constructivism and meta-cognitivism i.e. literacy, numeracy, critical thinking and problem solving; teacher centric to learner centric; individual learning to co-operative, collaborative and participatory learning; expository learning to discovery learning; and learning approach to non-linear approach. The pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centred, discussion- based, flexible, and enjoyable. Thus, the NEP, 2020 has envisioned to provide access, equity and quality of education; improving teaching-learning with technology; knowledge creation; innovation eco-system; capacity building and competencies; research out-comes; revamping curriculum, pedagogy, assessment, and student support; state-of-the-art infrastructure and learning materials.

1.2. EMERGING PLANNING PROFESSION NEEDS AND NEP 2020 INTERFACE

Rapid urbanization, climate change, livability challenges, infrastructural deficiencies, governance issues, etc. have been bringing the transformations in the planning profession in the 21st century. The NEP, 2020 has come up in an apt time to bring in the reforms by

revamping the planning education system in the country. Following are some of the key dimensions addressing the need and requirement to align the existing planning education system to the guidelines of NEP, 2020.

There are certain challenges faced by town and country education in India which need to be addressed. Some of the issues have already been flagged by the NITI Aayog in its Report on Reforms in Urban Planning Capacity. In addition, there are certain important impediments, which hamper the advancement of planning education. Some of them are discussed below:

- Multiple agencies dealing with planning education;
- Inadequate faculty and infrastructure in the planning institutes;
- Need to revise recruitment rules;
- Need to revise eligibility conditions for admission to PG Programme in planning;
- Separate Entrance Examination for UG Programme;
- Different nomenclatures of planning programme;
- Curricula revamping;
- Increasing institutional consultancy; and
- Promoting / encouraging research.

Even the Advisory Committee of NITI Aayog has given following recommendations:

- The history of human settlements in the Indian sub-continent must be taught to all young planners in a manner that can help them draw learnings about planning and management of ancient and medieval human settlements in India.
- The model curricula of PG degree programmes in urban planning has a limited focus on the planning of hilly and coastal regions as well as rural areas. Hilly areas require a distinct way of planning and management anchored on disaster resilience, sustainability, and livelihood creation. In addition to this, there is a dearth of planning professionals specialised in the planning of rural areas. Supply of qualified professionals in these streams needs to be created albeit in a limited way.
- The Central Universities and Technical Institutions in all the States/UTs of the Indian Himalayan Region may be encouraged to establish a 'Department of Planning and Public Policy' and also to offer PG programmes with specializations in 'Hill Area Planning', 'Environmental Planning', 'Regional Planning', and 'Rural Area Planning'. The sustainability and disaster management aspects would be an essential component of the same.
- NIRF does not enlist the 'Planning' domain discipline. Therefore, it is recommended for inclusion of planning as a discipline in NIRF. Planning may be used as an umbrella term, including all its specializations such as environment, housing, transportation, infrastructure, logistics, rural area, regional, etc.
- AICTE has an approved list of 25 nomenclatures for postgraduate degrees in planning. Therefore, it is recommended that AICTE may retain the names of specializations based on industry requirements. Nonetheless, the names of the degrees should be limited to only two nomenclatures: Bachelor of Planning/Bachelor of Technology in Planning and Master of Planning/ Master of Technology in Planning, with the specialization in brackets.
- For the growth and development of educational institutions, mentoring by peers is essential, therefore, it is recommended that the institutions in the domain of planning

education may identify prominent international and national institutes in various disciplines, and connect with them and sign MoUs for mentoring.

- For ensuring robust and quality teaching staff in planning education institutions a three-fold approach is recommended, as given below:
    - All the faculty in the urban planning domain needs to be motivated and incentivised by the respective institutions for taking part in the 'quality improvement programs'. Relevant international institutes can be roped in for bringing learnings from different contexts.
    - Faculty shortage in the educational institutions for conducting degree and Ph.D. programmes in planning need to be resolved in a time bound manner. In this regard, the faculty recruitment rules, particularly of the centrally funded technical institutions need to be reviewed to identify hurdles, if any, and amending them as per the rules and procedures laid-down.
    - The faculty needs to be encouraged to write and publish technical papers. This needs to be linked with their promotion so that quality improvement can be incentivised.

1.3. SKILL SETS OF PLANNERS

As the implications of urban planning travels beyond urban to rural, tourism, industrial, transport and logistics, regional, environmental, etc., therefore, the skill sets of Urban and Regional Planners need to encompass various aspects of multiple disciplines such as architecture, economics, environmental science, geography, finance, data analytics, etc. Master Plan / Development Plan essentially involves land allocation for various uses. Therefore, planners have to arrive at solutions for competing land uses, economic versus environmental considerations, and many other paradoxical situations, which need to be moderated through evidence-based decisions or trade-offs and incorporated in a spatial strategy that is most beneficial to the city, its surroundings, and masses. Therefore, the complexity of the task of city planning is remarkably high; and needs specialist skills as well as awareness. A planner is specially trained to possess skills for solving complex multi-sectoral challenges, moderating the competing pressures on land, posed by market forces, environmental considerations, and social needs, and take a balanced view in a citizen-centric approach, and also to work across disciplinary boundaries (Page 16, NITI Aayog Report, 2021).

1.4 TECHNICAL AND ANALYTICAL ROLE OF THE PLANNER

Various roles of town and country planners include town planning official, technical expert, project manager, advisor, consultant, faculty, etc., (page 15, NITI Aayog Report, 2021). However, some of the key functions of the town and country planners include:

- Preparation of Regional Plans, Master Plans / Development Plans; Zonal Plans; Site Plans; Local Area Plans; Special Area Plans for Coastal Areas, Port Areas, Heritage Areas, Disaster prone Areas, Stampede Prone Areas, Environmental Sensitive Area etc.
- Conducting feasibility studies, undertaking surveys, research, analysis, and documentation, detailed project reports, financial modelling, implementation, regulation, monitoring and evaluation;
- Analysis, drafting, preparation, implementation, and monitoring of spatial plans;
- Conducting research and developing strategies, supporting policies, programmes and key projects of the government at various levels;
- Contributing to the field through research and innovations;

- Developing innovative approaches to solve complex urban and regional challenges pertaining to housing, basic services, and transportation;
- Formulating policies and spatial plans integrating aspects of gender, universal access, climate change, safety and sustainability, etc.;
- Executing techno-legal roles, including building permissions and plan enforcement functions;
- Developing strategies for regional development;
- Developing policy frameworks for climate resilient planning and development/ adaptation of risk information in planning/ energy planning and management ;
- Implementing development projects and closely monitoring the impacts for mid-course corrections, if any;
- Engaging actively with different stakeholders;
- Enabling the balance amongst all relevant interests and competing land uses so as to solve conflicting demands on space and development; and
- Engaging with citizens and ensuring effective public participation at various levels of planning processes and their responsibilities.

1.5. STRUCTURE OF THE COURSE CURRICULUM AS PER NEP 2020

The Policy proposes to develop vocational, professional, critical/ responsive thinking, and ethical skills to attain skills enhancement, ability enhancement, multi-disciplinarity, and value-based education. It suggests inclusion of the following courses in the course curriculum leading to PG degree. It proposes

- **Foundation Courses** to have the basic knowledge of the discipline under study.
- **Professional Courses** to have comprehensive knowledge and coherent understanding of the discipline under study.
- **Interdisciplinary Courses** to ensure the development of capabilities across a range of disciplines including sciences, social sciences, arts, humanities, languages, as well as vocational subjects.
- **Environment Education Courses** to include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living.
- **Value Added Courses** to include the development of humanistic, ethical, Constitutional, and universal human values of truth, righteous conduct, peace, love, non-violence, scientific temper, citizenship values, and life skills.
- **Community Engagement and Service** to include lessons in service and participation in community service programs.
- **Global Citizenship Education and Education for Sustainable Development** to form an integral part of the curriculum to empower learners to become aware of and understand global and sustainable development issues and to become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies.
- **Digital and Technological Skills** to equip the students in the cutting-edge areas such as Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning.
- **Studio Activities** to engage the students in creative or artistic activities or experiential work.

- **Field Practice/ Projects** to engage the students to participate in field-based learning/ projects generally under the supervision of an expert.
- **Internship/ Research Internship** to provide the students with opportunities for internships with local industry, businesses, artists, crafts persons, etc., as well as research internships with faculty and researchers at their own or other HEIs/research institutions, so that students may actively engage with the practical side of their learning and, as a by-product, further improve their employability.
- **Research** to develop the ability to acquire the understanding of basic research ethics and skills in practicing/ doing ethics in the field/ in personal research work, regardless of the funding authority or field of study.

1.6. TITLE OF THE PROGRAMME AND EXIT OPTIONS

Orienting the planning education in line with the guidelines of NEP 2020, ITPI Committee recommends to start a Five-Year Integrated Programme (FYIP) in Planning which will be titled as B.Plan + M.Plan/ B.Tech. + M.Tech (FYIP) in Urban and Regional planning. Following awards and exits are proposed by the University Grants Commission through its publication 'Curriculum and Credit Framework for Undergraduate Programmes, 2022'.

a. **Diploma in Urban and Regional Planning:** Students who opt to exit after completion of the second year and have secured 80 credits will be awarded the 'Diploma in Planning', if, in addition, they complete internship/ research internship of 4 credits during the summer vacation of the second year. These students are allowed to re-enter the programme within a period of three years and complete it within maximum period of seven years including the period to attain the Diploma in Planning.

b. **Four-year UG Degree in Urban and Regional Planning:** A UG degree in the major discipline will be awarded to those students who complete a four-year degree programme with 164 credits. Such candidates need to complete internship/ research internship of 4 credits during the summer vacation of the sixth semester and also earn 12 credits from a research project/ dissertation in the eighth semester. The candidate may be awarded the degree of B.Plan/ B.Tech in (Urban and Regional Planning). These students are allowed to re-enter the programme within a period of two years and complete it within maximum period of seven years including the period to attain 4-year UG Degree Programme.

c. **Five-year Integrated PG Degree in Urban and Regional Planning:** A PG degree in a major discipline will be awarded to those students who complete a five-year degree programme with 204 credits. Such candidates need to complete internship/ research internship of 4 credits during the summer vacation of the sixth or eighth semester and also earn 12 credits from a research project/ dissertation in the tenth semester. The candidate may be awarded the degree of M.Plan/ M.Tech in Planning with major in a (Specialization), if the respective institute offers it. Otherwise, the candidate may be awarded the degree of M.Plan/ M.Tech in (Urban and Regional Planning). These students are allowed to complete the programme within a maximum period of seven years including the period to attain five-year UG Degree Programme.

1.7. PROGRAMME OBJECTIVES, OUTCOMES AND COMPETENCIES

The general objective of the PG programmes in Planning is to produce highly skilled professionals in planning to undertake policy and/or project matters in the public and private sector organizations. The graduates will understand the significance of planning in development of human settlements. The programme aims to explain planning paradigms and their applications and will be able to apply basic planning methods and techniques to organize, analyse, interpret and present different aspects of planning. They will be able to handle urbanization, housing, transport, environment, infrastructure, real estate, governance, public policy and planning matters in the urban and regional settings in an integrated manner based upon the advanced digital skills acquired by them. Upon completion of the respective programmes, they shall be equipped with the following learning outcomes:

- Understand the significance of planning and development in the context of Indian Knowledge Systems;
- Explain major planning paradigms and their applications;
- Articulate processes and rationales for planned interventions;
- Apply planning methods and techniques to organize, analyse, interpret and present information;
- Critically and creatively develop planning inquiries or processes to foster solutions-oriented decision-making;
- Effectively collaborate as a planning team to work with a client and/or stakeholders to assess and address a relevant planning problem to create a plan or professional report;
- Effectively present oral and written work (as a plan, professional report, or research paper) in a comprehensible, persuasive and professional manner;
- Have sufficient understanding of the legal and institutional framework for planning in the country and effectively undertake planning related regulatory activities guided by appropriate regulatory guidelines towards achieving balanced and sustainable development of Indian towns/cities, villages and regions;
- Appreciate the basic nature and characteristics of planning as a public service and the potential role to be played by the private sector in delivering planning and development services; and
- Develop vocational skills, professional ethics and critical/ responsive thinking in planning the human settlements and built environment.

1.8. DURATION OF THE PROGRAMME

The maximum duration of the Five-Year Integrated PG Programme would be **SEVEN** Years which will include clearance of any backlog. Maximum two exits after the even semesters and two entries at the beginning of the even semesters would be permitted during the seven years.

A semester comprises 90 working days and an academic year is divided into two semesters. A summer term is for eight weeks during summer vacation. Internship/ research internship can be carried out during the summer term. Regular courses may also be offered during the summer on a fast-track mode to enable students to do additional credits or to complete the backlogs in course work. The Higher Education Institutions can decide on the courses to be offered in the summer term depending on the availability of faculty and the number of students.

1.9. PROPOSED CREDIT SYSTEM

The planning institutes may follow National Credit Framework (2022): The Report of the High-Level Inter-Ministerial Committee on National Credit Accumulation & Transfer Framework of UGC for framing their credit framework.

a. Each course is assigned certain credits, as provided in the syllabus and Scheme of Examination.

b. Credits assigned to a subject shall be equal to the required hours of study per week, in any mode of instruction. One hour of study of a course per week in a semester shall normally be assign one credit.

c. A student shall earn the assigned credits upon achieving the minimum grade required for passing a course, i.e. grade 'D'

d. A student shall have to earn the required number of credits from the courses specified to successfully complete an academic programme. These shall be classified as Credit Courses.

e. A student shall have the option of studying certain other courses whose credits shall not be counted towards the total credits required for successfully completing an academic programme. These shall be classified as Audit Courses.

Examinations will be conducted regularly at the end of each semester, i.e. two times in each academic year.

1.10. TRANSFER OF CREDITS

The planning institutes may frame their policies on transfer of credits based on National Credit Framework (2022): The Report of the High-Level Inter-Ministerial Committee on National Credit Accumulation & Transfer Framework of UGC.

1.11. UG-PG LEVEL ACADEMIC CREDIT

The various sections outlined in this report reveal the possibilities of addressing UG level courses about entry and exit stages. These sections also inform the subjects that are offered from stage 1 to stage 10 (to be read as semesters). The need is to explain about the subjects that can be obtained academic credits from within the registered institution and outside the institution. As planning courses are inter/ multi-disciplinary in nature, it is suggested by ITPI that students may explore other disciplines outside their universities. For example, public policy, socio-cultural courses or research methodology can be obtained from across other universities and also from MOOC or online courses. However, this is restricted to theory subjects and internships within India. It is suggested that the planning institutions should explore possibilities of carrying out internships abroad. Also, they should explore possibilities of collaborative research projects within India and abroad.

It is also suggested by ITPI that the list of courses given earlier are limited but each institution may come out with new courses with the option for getting credit transfers depending upon the focus of the planning institutions. For example, if an institution/ university focus on AI/ MI or advanced remote sensing tools, it may accordingly adjust the subjects for obtaining credit transfers from external institutions. However, the total credit for each of the semester and for the overall UG courses may be maximum as recommended by UGC. If the number exceeds then over and above courses may be treated as audit courses instead of adding it to total credits. It is also recommended that some of these subjects from outside may also be introduced through MOOC/ODL mode.

It is also suggested that planning institutions should allow the students to obtain credits for internships from abroad and also to explore thesis abroad. ITPI also recommend the planning institutions, to go for joint studio programmes among planning institutions within India and

universities abroad, where each of the institution sign a MoU. This will increase the quality of planners in the long run.

As a part of the Commonwealth Planning Association, ITPI is also trying to explore whether the Master's programme from Commonwealth Universities can be brought on one platform. ITPI suggests the Ministry of Higher Education (MoE) and UGC to come out with a modified policy as in the case of medical institutions for obtaining degrees abroad for Planning too.

1.12. REGULATORY COUNCIL FOR PLANNING EDUCATION

AICTE should propose ITPI as regulatory authority for Planning Education in India to draw curricula, setting standards and assigning functions of coordination between teaching, research and extension in planning discipline exclusively.

1.13. PROPOSED PLACEMENT AVENUES AT DIFFERENT LEVELS

ITPI suggests the following (table 4) placement avenues after successfully completing the UG/ PG Programmes with multiple entry and exit options as per the provisions of NEP, 2020.

Table 4: Suggestive Placement Avenues at Different Levels of the Programmes

Title of Award	Job Title	Job Responsibilities
Diploma in Planning	**Industry** Planning Assistant	Collection of socio-economic data and preparation of maps etc. under the guidance of Junior Town Planner.
	Academics Research Assistant	Assisting in data collection and its analysis under the supervision of the Principal Researcher.
UG Degree	**Industry** Assistant Town Planner	Supervision of works of PAs and JPAs along with writing reports after thorough analysis.
	Academics Research Associate	Assisting in analysis, report writing and maintenance of lab under the supervision of the Principal Researcher.
Integrated PG Degree Standalone Two-Year PG Degree	**Industry** Assistant Town Planner	Supervision of works of Planning Draftsman, Planning Assistant, and Junior Town planner along with responsibility for policy formulation.
	Academics Assistant Professor	Teaching and research

Note: Industry means government/ public sector/ para-statal/ private institution.

1.14. SUPPLEMENTARY SUGGESTIONS

Some of the institutional level suggestions for the success of the proposed structure of the planning programme, as per the NEP, 2020, are as under.

- The Planning Institutes shall promote global networking; strategic alliances; technology enabled learning; e-content and resource-based learning; research collaboration; demand driven programmes/ courses; active industry-academia interface; and technology incubation.
- Multi-disciplinary programmes shall be designed to impart basic, advanced, competent, and expert level education. Some of the proposed specialized PG Programmes in this context are as under:
  1. Landscape, Ecology and Resource Planning

2. Heritage and Conservation of Special Areas
3. Sustainable Habitat
4. Logistics and Freight Management
5. Sustainable Mobility Management
6. Urbanism and Resilient Planning
7. Hill Area Planning

- Capacity building training programmes shall be organized periodically for the industry and academia to refresh and orient the planning ideas, contemporary practices, and technological advancements.
- Deliberate and suggest the mechanism to share the Academic Bank of Credits among the institutes imparting Planning Education.
- Deliberate and suggest for allowing the lateral entry of the candidates from the other planning education institutes at different Entry/Exit points, as suggested by NEP 2020.
- Online and open distance learning (ODL) teaching systems shall be evolved and practiced for quality teaching-learning mechanism as a part of Full Time Programme.
- The Planning Institutes shall promote collaborative research, e-studios, and exchange.
- The Planning Institutes shall promote research-based specialization, especially in studio and internship to encourage Global Citizen Education (GCEd).
- The Planning Institutes shall promote academia-government-industry linkage.
- The Planning Institutes shall inculcate pedagogical reforms - communication, discussion, debate, research, and opportunities for cross-disciplinary and interdisciplinary thinking.
- The Planning Institutes shall start Executive PG Programme in Planning for working professionals. It may be in part-time or online mode.
- The Planning Institutes shall start short term innovative/ skill development courses for the benefit of the society and the professionals.
- The Planning Institutes shall adopt criterion-based grading system as suggested by NEP, 2020 in which the student is assessed for his achievements based on the learning goals for each programme.
- The Planning Institutes shall establish incubation centre, technology development centre, quality libraries (possibly sharable digital libraries), and research centre shall be established in each Planning Institute as student support systems.
- Networking of the Planning Institutes is proposed for vivid purposes.
- All the Planning institutes of India shall conduct common entrance test for admission to their programmes.
- Work out a mechanism of transfer of credits and fee structure for different courses in the Planning Institutes.
- MOOC Courses on DIKSHA/SWAYAM shall be promoted by the Planning Institutes. Teachers shall be encouraged and incentivised to develop more SWAYAM courses to the interest of the students.
- More value-added courses shall be included in the programmes to make the students responsive, responsible, and disciplined.

In addition, it is suggested that the educational institutes shall introduce

- Executive Programmes (for senior officials, junior officials in government and private sector) with minimum three years' experience.
- 3 or 6 months Short Term Programmes on emerging areas in spatial planning & development such as urban mobility, climate change and resilience, disaster management, SDGs, data sciences etc.
- Faculty Development Programmes for Academic Institutions to enhance the capacities of the faculty in these institutions.

SECTION – II

PROGRAMME PRELIMINARIES AND STRUCTURE

2.1. GENERAL PROGRAMME STRUCTURE AND CREDITS

Composition of Structure of Planning Programme

The structure of the Integrated Five-Year Post-Graduate Programme in Planning discipline will comprise of the following categories of courses:

1. Major Courses
2. Minor Courses
3. Inter-Disciplinary/ *Multi-disciplinary* Course*s* (decided by the respective educational institution as per its policy), which can be through MOOC/NTPEL course also.
4. Skill Enhancement Courses such as Internship/Studio/Thesis*/Dissertation*
5. Ability Enhancement Courses
6. Value Added Course Courses (decided by the respective educational institution as per its policy)

Course Code Definitions

L Lecture
T Tutorial
U Studio
C Credits

Definition of Credit

1 Hour Lecture per week 1 Credit
1 Hour Tutorial per week 1 Credit
2 Hour Studio per week 1 Credit

Range of Credits

On the completion of 2 Years (4 Semesters), if a candidate opts to exit	84 Credits
On the completion of 4 Years (8 Semesters), if a candidate opts to exit	164 Credits
On the completion of 5 Years (10 Semesters)	204 Credits

Duration and Exit and Entry Policy

The maximum duration of the Five-Year Integrated PG Programme would be **SEVEN** Years which will include clearance of any backlog. Maximum two exits after the even semesters and two entries at the beginning of the even semesters would be permitted during the seven years.

2.2. SUGGESTED ENTRY QUALIFICATIONS FOR FYIP IN PLANNING

A candidate with 50% marks in 10+2 Examination from a recognized institute.

OR

A candidate with 50% marks in Matric Examination (10th Standard) and having passed 3 years diploma in Architecture or Architectural Assistantship or Civil engineering from a recognized statutory institute or any other recognized by the Institute of Town Planners India, New Delhi to be eligible for admission in the 1st Year of FYIP in Planning.

OR

A candidate with 50% marks in 10+2 Examination and having passed 2-year diploma in Architecture or Architectural Assistantship or Civil engineering from a recognized statutory institute or any other recognized by the Institute of Town Planners India, New Delhi to be eligible for admission in the 1st Year of FYIP in Planning.

(For all the candidates not having passed mathematics at the 10+2 level will have to do ONE additional course in mathematics, in the first semester of the FYIP as Audit Course (Bridge Course))

Note:

1. The relaxation in the marks for being eligible to the FYIP for the SC/ST/OBC categories will be as per the policy of the Central/ State government.
2. For any clarifications, contact the ITPI, headquarter in writing and get written response for the same

UGC has proposed that all candidates having a Two-Year PG degree or Five-Year Integrated PG degree or a 4-year UG degree with research (having scored 75 percent marks or CGPA 7.5) shall be eligible to undertake Ph.D. programme in the major discipline. But such students must qualify an institutional level entrance test or national level eligibility tests such as UGC NET or GATE

2.3. AWARD OF DIPLOMA AND DEGREES

i. On the completion of 2 Years (4 Semesters), if a candidate opts to exit

(The candidate may be awarded the Diploma in Planning)

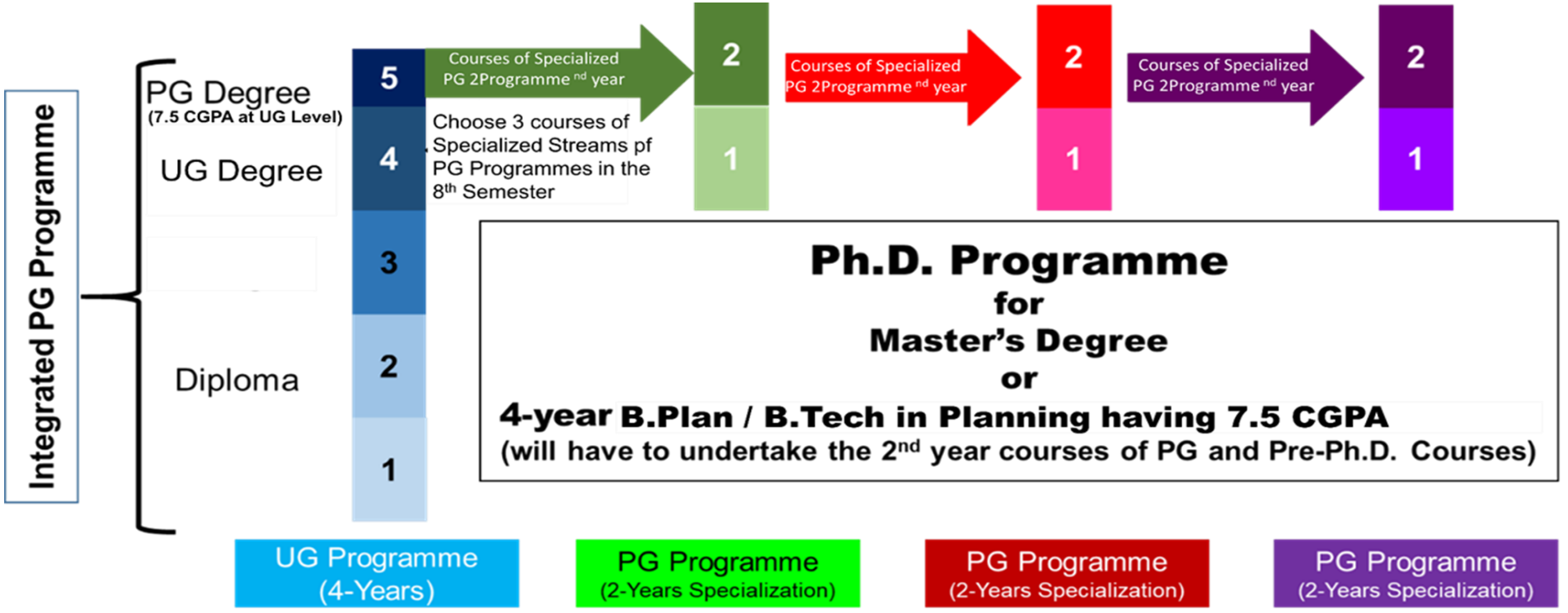
ii. On the completion of 4 Years (8 Semesters), if a candidate opts to exit

(The candidate may be awarded the degree of B.Plan/ B.Tech in Urban and Regional Planning)
(A candidate attaining 7.5 CGPA will be eligible for admission to Ph.D. and will have to undertake the courses M.Plan/ M.Tech 2nd year and other Pre-PhD courses as proposed by the respective Institute.)

iii. On the completion of 5 Years (10 Semesters)

(The candidate may be awarded the degree of M.Plan/ M.Tech in Planning with a major in a Specialization, if the respective institute offers it. Otherwise, the candidate may be awarded the degree of M.Plan/ M.Tech in Urban and Regional Planning. Such candidate will also be awarded the degree of B.Plan/ B.Tech on completing four years of the Five Integrated Programme.

2.4. PROPOSED CONCEPT OF FIVE YEAR INTEGRATED PROGRAMME IN PLANNING



2.5. PROPOSED STRUCTURE OF FYIP IN PLANNING BASED ON UGC GUIDELINES

Semester	*Major (Core)*	*Minor*	*Inter-Disciplinary/ Multi-Disciplinary Courses*	*Ability Enhancement Courses (Language)*	*Skill Enhancement Courses /Internship /Dissertation*	*Common Value-Added Courses*	*Total Credits*
I	*1 Course (3 Credits) 1 Studio (4 Credits)*	*1 Course (2 Credits)*	*1 Course (3 Credits)*	*1 Course (2 Credits)*	*1 Course (3 Credits)*	*1 Course (3 Credits)*	*20*
II	*1 Course (3 Credits) 1 Studio (4 Credits)*	*1 Course (2 Credits)*	*1 Course (3 Credits)*	*1 Course (2 Credits)*	*1 Course (3 Credits)*	*1 Course (3 Credits)*	*20*
III	*1 Course (3 Credits) 1 Studio (5 Credits)*	*2 Courses (4 Credits)*	*1 Course (3 Credits)*	*1 Course (2 Credits)*	*1 Course (3 Credits)*	-	*20*
IV	*2 Course (6 Credits) 1 Studio (8 Credits)*	*2 Courses (4 Credits)*	-	*1 Course (2 Credits)*	*1 Course (4 Credits)*		*24*
The candidates exiting the Programme after securing 80 credits will be awarded Diploma in Planning provided, they secure 4 credits (additional) by undertaking 8 weeks summer internship after 4th Semester							***84***
V	*2 Course (6 Credits) 1 Studio (8 Credits)*	*3 Course (6 Credits)*	-	-	-	-	*20*
VI	*2 Course (6 Credits) 1 Studio (8 Credits)*	*3 Course (6 Credits)*	-	-	-	-	*20*
	Summer Internship *(4 credits (additional) to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student who opts for FYIP. Its credits will be added over and above the total credits of the seventh semester)*						
VII	*2 Course (6 Credits) 1 Studio (8 Credits)*	*3 Course (6 Credits)*	-	-	*1 Course (4 Credits)*	-	*24*
VIII	***Option – I: For the students opting exit after four years by undertaking Dissertation***						
	2 Course (6 Credits)	*1 Course (2 Credits)*	-		*Dissertation (12 Credits)*		*20*
(The candidate exiting the programme will be awarded the degree of B.Plan/ B.Tech in Urban and Regional Planning) (A candidate attaining 7.5 CGPA will be eligible for admission to Ph.D. and will have to undertake the courses M.Plan/ M.Tech 2nd year and other Pre-PhD courses as proposed by the respective Institute.							*164*
	Option –II: For the students continuing for Five Year Integrated Programme						
VIII	*2 Course (6 Credits) 1 Studio (8 Credits)*	*3 Course (6 Credits)*					*20*
	Summer Internship *(4 credits (additional) to be undertaken during the summer vocations for 8 weeks after the eighth semester by the student who opts for FYIP. Its credits will be added over and above the total credits of the ninth semester)*						
IX	***Courses to be studied from the 3rd semester of the opted specialized PG Programme in Planning***						*20*
X	***Courses to be studied from the 4th semester of the opted specialized PG Programme in Planning***						*20*
(The candidate will be awarded the degree of M.Plan/ M.Tech in Planning with major in a Specialization, if the respective institute offers it. Otherwise, the candidate may be awarded the degree of M.Plan/ M.Tech in Urban and Regional Planning)							*208*

SECTION III

OUTLINE SCHEME AND DETAILED CURRICULUM OF FIVE-YEAR INTEGRATED PROGRAMME IN PLANNING

3. OUTLINE SCHEME OF FIVE-YEAR INTEGRATED PROGRAMME IN PLANNING

Diploma in Planning						
First Semester						
Course Title	**Nature**	**Credits**	**L**	**T**	**U**	
History of Settlement and Planning	Major	3	2	1	0	
Techniques of Planning	Minor	2	2	0	0	
Social-cultural and Economic Aspects of Settlements	MD	3	2	1	0	
Environmental Studies	VA	3	2	1	0	
Qualitative and Quantitative Methods of Planning	SE	3	2	1	0	
Local Area Language	AE	2	2	0	0	
Planning Studio: Map Graphics and Presentation Techniques	Major	4	0	0	8	
Basic Mathematics* ***(* means the mandatory course for the students who did not have mathematics in their 10+2 programme)***	Audit	0	2	0	0	
English* ***(* means the mandatory course for the students who did not have english in their 10+2 programme)***	Audit	0	2	0	0	
Total Credits		**20**				
Second Semester						
Course Title	**Nature**	**Credits**	**L**	**T**	**U**	
Fundamentals of Planning	Major	3	2	1	0	
Site Surveying and Land Development	Minor	2	2	0	0	
Statistical Methods	MD	3	2	1	0	
Universal Human Values	VA	3	2	1	0	
Computer Fundamentals for Spatial Planning	SE	3	0	0	6	
Communication and Writing Skills	AE	2	2	0	0	
Planning Studio: Area Appreciation (Urban and Rural)	Major	4	0	0	8	
Total Credits		**20**				
Third Semester						
Course Title	**Nature**	**Credits**	**L**	**T**	**U**	
Planning Theory	Major	3	2	1	0	
Planning for Utilities	Minor	2	2	0	0	
Land Economics and Real Estate Management	Minor	2	2	0	0	
Geographic Basis in Planning or Fundamentals of Design (institution may decide any one of these)	MD	3	2	1	0	
Basics of Information Technology and Programming	SE	3	2	1	0	
Liberal Learning Courses	AE	2	2	0	0	
Planning Studio: Site Planning/Neighbourhood Planning	Major	5	0	0	10	
Total Credits		**20**				
Fourth Semester						
Course Title	**Nature**	**Credits**	**L**	**T**	**U**	
Transportation Planning – I	Major	3	2	1	0	
Housing	Major	3	2	1	0	
Landscape, Ecology and Resource Planning	Minor	2	2	0	0	
Geoinformatics and Data Analytics	Minor	2	2	0	0	
History and Culture of Local Area	AE	2	2	0	0	
Planning Studio: Village / Zonal Development Plan	Major	8	0	2	12	
Total Credits		**20**				
Summer Internship (to be undertaken during the summer vocations for 8 weeks after the fourth semester by the student who opts to exit after the fourth semester. Its credits will be added over and above the total credits of the fourth semester)	SE	4	0	0	8	
Grand Total		**84**				

The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect thedata required for the respective studio exercises.

B.Plan/B.Tech (Urban and Regional Planning)

Fifth Semester

Course Title	Nature	Credits	L	T	U
Transportation Planning – II	Major	3	2	1	0
Regional Planning	Major	3	2	1	0
Estimation, Specification and Valuation	Minor	2	2	0	0
Mitigation Planning for Stampede Prone Areas	Minor	2	2	0	0
Climate Change and Sustainable Development	Minor	2	2	0	0
Planning Studio- Master Plan/ Development Plan	Major	8	0	2	12
Total Credits		**20**			

Sixth Semester

Course Title	Nature	Credits	L	T	U
Planning Legislation	Major	3	2	1	0
Rural Habitat Planning	Major	3	2	1	0
Governance and Plan Implementation	Minor	2	2	0	0
Urban and Regional Infrastructure Planning	Minor	2	2	0	0
Tactical Urbanism and Design	Minor	2	2	0	0
Planning Studio - Regional Plan	Major	8	0	2	12
Summer Internship (to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student. Its credits will be added over and above the total credits of the seventh semester)	SE	4	0	0	8
Total Credits		**20**			

Seventh Semester

Course Title	Nature	Credits	L	T	U
Research Methods	Major	3	2	1	0
Project Formulation, Appraisal and Management	Major	3	2	1	0
Environment Planning	Minor	2	2	0	0
Development Finance	Minor	2	2	0	0
Dissertation Preliminaries	Minor	2	0	2	0
Planning Studio- Detailed Project Report/ Feasibility Study	Major	8	0	2	12
Summer Internship (to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student. Its credits will be added over and above the total credits of the seventh semester)	SE	4	0	0	8
Total Credits		**24**			

Eighth Semester

Option – I (for the students opting exit after four years by undertaking Dissertation)

Course Title	Nature	Credits	L	T	U
Professional Practice and Ethics	Major	3	2	1	0
Public Policy and Planning	Major	3	2	1	0
Heritage Conservation and Urban Renewal	Minor	2	2	0	0
Planning Studio – Planning Dissertation	Major	12	0	5	14
Total Credits		**20**			

The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the respective studio exercises

M.Plan/ M.Tech (FYIP) in Planning with Major						
	Eighth Semester **Option – II (for the students continuing for Five Year Integrated Programme)**					
	Course Title	**Nature**	**Credits**	**L**	**T**	**U**
	Professional Practice and Ethics	Major	3	2	1	0
	Public Policy and Planning	Major	3	2	1	0
	Urban Supply Chain Management	Minor	2	2	0	0
	Heritage Conservation and Urban Renewal	Minor	2	2	0	0
	Politics, Planning and Development	Minor	2	2	0	0
	Planning Studio- Special Area Plans	Major	8	0	2	12
	Total Credits		**20**			
	Ninth Semester					
	The candidate will pick the courses from the Third Semester of Specialize PG Programmes in Planning					
	Tenth Semester					
	The candidate will pick the courses from the Fourth Semester of Specialize PG Programmes in Planning. Each candidate will do thesis in the respective specialization					

Alternative Suggestive Outline Structure of Ninth and Tenth Semesters for *B.Plan-M.Plan/ B.Tech-M.Tech* (FYIP) Programme for the Institutions not having any specialized PG Programmes

M.Plan/M.Tech (FYIP) (Urban and Regional Planning)						
	Ninth Semester					
	Title of the Course	**Nature**	**Credits**	**L**	**T**	**U**
	Smart Cities	Major	3	2	1	0
	Inclusive Cities	Major	*3*	2	1	0
	Technology and Sustainable Cities	Minor	2	2	0	0
	Advanced Spatial Data Analytics	Minor	2	2	0	0
	Energy and Planning	Minor	2	2	0	0
	Planning Studio – Future Cities	Major	8	0	2	12
	Internship (Optional)	Audit				
	Total Credits		**20**			
	Tenth Semester					
	Course Title	**Nature**	**Credits**	**L**	**T**	**U**
	Modelling Urban Dynamics	Major	3	2	1	0
	Climate Resilient Cities	Major	3	2	1	0
	Economic Policy and Local Development	Minor	2	2	0	0
	Planning Studio – Planning Thesis	Major	12	0	5	14
	Total Credits		**20**			

The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the respective studio exercises.

3.1. Model Curriculum for Five Year Integrated Programme

Programme Objectives

- The B.Plan-M.Plan/ B.Tech.-M.Tech (Five Year Integrated) Programme in planning is designed to prepare students in the skills of analysing the physical, social, cultural, economic and ecological dimensions of urban and rural settlements.
- To comprehend the issues in cities/towns, city regions, and rural areas, to plan and design for the current and future of metropolitan cities, towns and rural areas new innovative tools and policies needs to be developed and imparted to the new generation of planners. Along with a group of core courses, specializations are built around courses such as city and metropolitan planning, infrastructure, municipal finance, information system, GIS, community participation, disaster risk reduction and resilience, district planning and rural development, resettlement and redevelopment, development management and governance, project planning, policies and laws, professional practice and ethics.
- The programme includes studio exercises in plan preparation through live case studies related to comprehensive and micro level

Programme Outcomes

At the end of this course, a student may be well equipped to prepare a Master Plan/City Development Plan/Metropolitan Regional Plan, Regional Planning and Village Planning. He will be able to prepare plans at various scales such as site planning to regional level plans. They can be employed from Central government, State departments, District Planning Authority/Board, Municipality/Municipal Corporations/Towns Panchayats, Metropolitan Development Authority, SEZ, Investment Zones, etc. for plan preparation, plan implementation, monitoring and evaluation

	First Semester					
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	History of Settlement and Planning	Major	2	1	0	3
	Techniques of Planning	Major	2	0	0	2
	Social-cultural and Economic Aspects of Settlements	Minor	2	1	0	3
	Environmental Studies	Multi-Disciplinary	2	1	0	3
	Qualitative and Quantitative Methods of Planning	Value Added	2	1	0	3
	Local Area Language	Skill Enhancement	2	0	0	2
	Planning Studio: Map Graphics and Presentation Techniques	Ability Enhancement	0	0	8	4
	Total Credits					**20**

Basic Mathematics* ***(* means the mandatory course for the students who did not have mathematics in their 10+2 programme)***	Audit	0	2	0	0
English* ***(* means the mandatory course for the students who did not have english in their 10+2 programme)***	Audit	0	2	0	0

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***History of Settlement and Planning***
No. of Credits	*3 (L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand various civilizations and their characteristics.
- to understand the concepts of various scholars and develop understanding of planning thoughts.

Course Contents

Unit 1: Historical Perspectives

The importance of studying historical processes, articulating history for the cause of planning purposes, Place making in history from caves to agrarian society; the historical context of urbanization; Town planning considerations (Site selection and planning process) in ancient India from ancient texts and treatises; Classification of ancient Indian settlements

Unit 2: Characteristics of Settlements in Different Civilizations

Characteristics of cities and planning considerations in ancient classic civilizations: Greek urban civilization, Roman urban civilization, Egyptian urban civilization and Mesopotamian urban civilization; Cosmopolitan Planning; Medieval Town Planning and renaissance in Europe: case studies; Industrial revolution and its impact on city planning in Europe

Unit 3: Indian Planning in Medieval Era

Pre-Medieval Planning in India; Medieval Town Planning in India and influence of Indo-Sarsenic culture: (case studies: Fatehpur Sikri; Shahjahanabad); Post-medieval town planning: Sikh towns, Site selection and characteristics; Case Studies from India; Principles of British Colonial settlement planning in India

Unit 4: Planning Concepts

Capital Cities in India: case study- Bhubaneswar; Town Improvement and City Beautiful Movements; Planning Thought: Ebenezer Howard- Concept of Garden City, Planning Philosophy of Patrick Geddes, Patrick Abercrombie- Planning Philosophy and surveys to be performed for planning, Sorya Y. Mata- Linear city, Tony Garnier: Concept of Industrial City, Planning concepts of Le Corbusier, Clarence Arthur Perry- Principles of Neighbourhood planning and Design, F.L. Wright- Broadacre City, New Towns in India: Chandigarh, Auroville; Industrial Towns Movement in India, Case Study- Rourkela.

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

- to analyse the classification of Asian settlements and their planning considerations.
- to identify various characteristics and planning considerations in different civilizations.
- to identify the characteristics of medieval town planning in India.
- to develop understanding about various planning thoughts and concepts used to plan the new cities

References:

1. Allmendinger, P. (2017). Planning Theory. Macmillan, London.
2. Fainstein S. (2012). Readings in Planning Theory. Blackwell Publishing, Oxford.
3. Hall P. (2014). Cities of Tomorrow: An Intellectual History of Urban Planning and Design since 1880. Wiley and sons, Hoboken.
4. Pojani Dorina (2023). Alternative Planning History and Theory. Routledge, London.
5. Beauregard Robert A. (2020). Advanced Introduction to Planning Theory. Edward Elgar Publishing, Cheltenham.
6. Singh Satvir (2019). Settlement Patterns and Planning in India. Akinik Publications, Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Techniques of Planning***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to list the data sets required for undertaking studies for different types and levels of planning;
- to collect and interpret different types of data;
- to list the steps in analyzing the trends of various spatial and non-spatial variables; and
- to learn the basic protocols of data representation.

Course Contents

Unit 1: Types and Sources of Data for Planning

Concept, need and definition of Data Inventory; Classification of data; Difference between data, information and Knowledge; Distinction between facts and Opinions; Data requirements for urban and regional planning; Primary and secondary data; Sources of secondary data. Overview of data availability from different sources e.g., Census of India, NSSO, Survey of India, etc.

Unit 2: Data Collection Methods - Physical and Socio-Economic Surveys

Quantitative data collection: questionnaire design and execution; pilot surveys; design of sample surveys; types of sampling; measurement scales; data coding and data verification. Qualitative data collection: focus group discussion, individual interviews, observations and reconnaissance, and ethnographic methods. Physical Surveys - preparation of base maps, contents of base maps; scales; techniques for conducting surveys for land use, building use, density and other surveys; Sources of spatial data: Topo-sheets, aerial photography, satellite imagery, GSI, Bhuvan Geo-portal, etc.

Unit 3: Data Analysis, Reasoning and Relationships

Data tabulation, statistical methods, frequency distribution, classification, mean, median, mode; correlation, content analysis; Land Use classification system; planning standards, population and economic analysis; Land Suitability analysis, housing analysis; and development of indicators.

Unit 4: Data Representation

Determination of Sample size; Preparation of tables and charts; Interpreting statistical, qualitative and spatial data to identify trends, patterns and processes; Communication of data through presentations, reports etc. Land Use and land cover classification and coding at various levels; Coloured and black & white presentation techniques; Basic protocols of illustrations.

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

- to design and execute questionnaires;
- to conduct surveys of various types;
- to calculate trends of different spatial and non-spatial indicators;
- to interpret land-use classification and coding; and
- to refer to the protocols of illustration.

References:

1. Ansari J. H. and Mahavir (1986). A Reader in Planning Techniques. Institute of Town Planners, India (ITPI), New Delhi.
2. Greed C. (2004). Introducing Planning. Continuum, London.
3. Kulshrestha S. K. (2006). Dictionary of Urban and Regional Planning. Kalpaz Publications, New Delhi.
4. Ministry of Urban Development and Town and Country Planning Organisation (2014). Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI). Govt. of India, New Delhi.
5. V. Loannis & Dimitris Vrakas (2023). Intelligent Techniques for Planning. IGI Global, Pennsylvania.
6. Edward J. Jepson and Jr., Jerry Weitz (2020). Fundamentals of Plan Making: Methods & Techniques. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Social-cultural and Economic Aspects of Settlements***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the interrelation between social, cultural, and economic aspects in shaping settlements.
- to analyse the impact of social structures and economic systems on urban development.
- to develop strategies for promoting social equity, cultural preservation, and economic sustainability in urban planning.
- to enhance skills in analyzing and interpreting social and economic data for planning processes

Course Contents

Unit 1: Introduction to Social and Cultural Aspects of Settlements

Definition and evolution of human settlements: rural to urban transitions; Understanding community, society, and social structure in urban contexts; Cultural dynamics in settlements: traditions, heritage, and spatial identity; Influence of religion, ethnicity, and social norms on settlement patterns; Case studies on culturally significant settlements and their preservation.

Unit 2: Social Issues in Urban Planning

Urbanization and its social impacts: migration, diversity, and social integration; Issues of social inequality, segregation, and gentrification in cities; Planning for inclusive settlements: gender, age, and differently-abled perspectives; Role of community participation and social capital in sustainable settlements; Policies and frameworks promoting social justice in urban development.

Unit 3: Economic Aspects of Settlements

Introduction to urban economies: formal and informal sectors; Role of industries, services, and markets in shaping settlements; Employment patterns, income distribution, and economic disparities; The impact of globalization and economic policies on urban growth; Case studies of economic drivers urban transformations.

Unit 4: Integrated Social-Economic Planning for Sustainable Settlements

Strategies for integrating social and economic considerations in urban planning; Planning for affordable housing, livelihoods, and basic services; Role of local governance, NGOs, and community organizations in settlement development; Measuring social and economic sustainability: indicators and methodologies. Best practices and case studies of successful integrated urban development.

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

- to develop skills to design settlements that are socially inclusive, culturally sensitive, and economically sustainable, aligning with global best practices in urban planning.

References:

1. Gehl J. (2010). Cities for People. Island Press, Washington D.C.
2. Jacobs J. (1992). The Death and Life of Great American Cities. Vintage, New York.
3. Dholakia J.R. (2017). Perspectives on Inclusive Growth in India: The Social Fabric of Cities. Taylor and Francis, London.
4. Kleniewski N. and Alexander R. Thomas (2019). Cities, Change and Conflict. Taylor and Francis, London.
5. Smith David M. (2023). Urban Sociology: A Global Introduction. Cambridge University Press, New Delhi.
6. Held D. and Henrietta L. L. L. (2022). The Social and Cultural Construction of Risk: Shifting Cultures in a Globalizing World. Cambridge University Press, New Delhi.
7. Hargrove John M. (2023). Sociology of Urban and Rural Settlement: Understanding the Interplay of Space, Society, and Economy. University of Chicago Press, Chicago.

Course Code	*As per Institutional Policy*
Nature of Course	*Value Added (VA)*
Course Title	***Environmental Studies***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the scope and importance of environmental studies, different natural resources (forests, minerals, energy, water, land, food, biodiversity) and their utilization as well as conservation methods.
- to understand the importance of ecosystem structure and function; different types of environmental pollution (air, water, soil, thermal, nuclear and noise), environmental law and remedial methods.
- to make aware of the consequences of population explosion; diseases such as HIV/AIDS and various family welfare programs.

Course Contents

Unit 1: Basics of Environment

Definition, scope and importance, Need for public awareness Natural resources and associated problems.

Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles.

Unit 2: Ecosystem

Concept of an ecosystem; Structure and function of an ecosystem: Producers, consumers and decomposers; Energy flow in the ecosystem; Ecological succession; Food chains, food webs and ecological pyramids; Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries); Introduction and Definition: genetic, species and ecosystem diversity; Bio-geographical classification of India; Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values; Biodiversity at global, national and local levels; India as a mega- diversity nation; Hot-spots of biodiversity; Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts, Endangered and endemic species of India; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 3: Environment related Legislations

Definition, Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution; Solid waste management:

Causes, effects and control measures of urban and industrial wastes; Role of an individual in prevention of pollution; Pollution case studies; Disaster management: floods, earthquake, cyclone and landslides

From unsustainable to sustainable development; Urban problems related to energy, Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people: its problems and concerns; Case studies and environmental ethics: Issues and possible solutions; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Case studies: Wasteland reclamation, Consumerism and waste products; Environmental Protection Act, 1986, Air (Prevention and Control of Pollution) Act, 1981; Water (Prevention and control of Pollution) Act, 1974; Wildlife Protection Act; Forest Conservation Act; Issues involved in enforcement of environmental legislation, Public awareness

Unit 4: Case Studies

Population growth, variation among nations Population explosion: Family Welfare Programmes; Environment and human health; Human Rights; Value Education, HIV / AIDS, Women and Child Welfare; Role of Information Technology in Environment and Human Health; Case Studies; Healthy Cities; Sustainable Development Goals; Climate Change and adaptation at micro to macro level measures.

Field Work

Visit to a local area to document environmental assets river/forest/ grassland/ hill/ mountain

Visit to a local polluted site – Urban / Rural / Industrial / Agricultural

- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc.

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

- to appreciate the effects of environmental pollution and remediation.
- to identify the causes, effects and remedial measures.
- to follow sustainable lifestyle patterns.
- to appreciate the environmental Acts and Rules.

References:

1. Rajagopalan R. (2011). Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
2. Sharma J. P., N.K. Sharma and N.S. Yadav. (2005). Comprehensive Environmental Studies. Laxmi Publications, New Delhi.
3. Sharma P. D. (2009). Ecology and Environment. Rastogi Publications, Meerut.
4. CSE (2024) State of India's Environment. Centre for Sciences and Environment, New Delhi.
5. Kumar Santosh, M.P. Poonia and S.C. Sharma (2021). Environmental Studies. Khanna Book Publishing Co. (P) Ltd., New Delhi.
6. Gupta Susmita and Abhik Gupta (2021). Environmental Studies: Principles and Practices. Sage Publications, New York.
7. Dr. Saran R.K. (2023). Environmental Laws and Legislations in India: Futuristic Research Trends. Notion Press, Chennai.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Enhancement (SE)***
Course Title	***Qualitative & Quantitative Methods in Planning***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to collect, interpret and use, fair and ethical data for decision making in urban planning.
- to expose students to the fundamentals of data handling and management in urban planning.

Course Contents

Unit 1: Data in Planning

The need for data in planning; types of data- Primary and secondary, qualitative and quantitative; Survey and structured Data: census of India data, SECC, the National Sample Survey Office (NSSO); open-source data; public portals, open data repositories; urban data access portals: City/ Public Dashboards; scales of urban data, formats of data.

Unit 2: Ethical Data Collection: Conventional Methods for Qualitative and Quantitative Data

Sampling design (qualitative and quantitative), measurement scales and scaling techniques; Social research surveys: Structured Observation, interviewing (open, semi-structured and structured), focus group discussions, questionnaire design and schedules; case-study method; documents as source of data; media analysis; Techniques of Conducting socio-economic Surveys; Physical and spatial surveys: Land and land use survey; built-up survey; infrastructure and road inventory; and Specialised surveys: accessibility surveys; urban safety surveys; Urban Forest/landscape Inventory; ethics in data collection: reliability, reproducibility, interoperability and acknowledgement; rights and privacy issues.

Unit 3: Data Analysis: Conventional Methods

Using demonstration methods (hands-on) through the basic use of software and tools (MS Excel, OpenOffice.org., etc.), the students to be taught basics of data preparation and data tabulation, data cleaning and adjustment; Descriptive statistical analysis: trends, groupings, frequency distribution, classification, mean, median, mode (central tendencies), measures of dispersion, measures of relationship, regression and correlation; Document analysis and content analysis for qualitative data analysis.

Unit 4: Visualisation of Data and Citizen Engagement

Conventional techniques of data visualisation like frequency tables, cross-tabulation tables, Bar charts, line graphs, pie-charts, scatter graphs etc.; word clouds, word frequency charts, etc; Narrative Techniques for Urban Data Visualisation; Basic principles of Participatory Action Planning (PAP); Community Workshops, Public Meetings & Town Hall Forums; use of technology in citizen engagement.; fundamentals of crowdsourced Information for Urban Planning, citizen sciences and AI in PAP; Civic, tacit and traditional knowledge in communities as data.

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

- to understand the significance and use of quantitative and qualitative research methods in urban planning practice
- to interpret data to extract meaningful interpretations and insights

- to learn to present data effectively through maps, charts, and other visual tools.

Pedagogical note: *Adopting a Case-study pedagogical approach, sample reports (prepared by the World Bank, ADB and alike), sample development plans and graphically stimulating and conveying content may be used to impart the skills and knowledge. It is recommended to adopt an active learning pedagogy wherein students conduct and generate their own set of data to be processed as a time-bound exercise/ assignment.*

References:

1. Bryman A. (2016). Social Research Methods. Oxford University Press, London.
2. Kothari C. R. (2004). Research Methodology: Methods and Techniques. New Age International, New Delhi.
3. Wang L. (2021). Data analytics and modelling accessibility change of high-speed rail network development: a door-to-door approach. SAGE Publications Ltd, New Delhi.
4. Rae A. & Wong C. (2021). Applied data analysis for urban planning and management. SAGE Publications Ltd., New Delhi.
5. Anandhi and Snehasis Mishra (2022). Handbook of Land Survey in India. Shipra Publications, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Ability Enhancement (AE)***
Course Title	***Local Area Language***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to improve the reading skills of students.
- to make the students proficient in technical aspects of formal and informal communication.
- to achieve the excellence in lexicon and syntax of Local language.
- to enhance and upgrade their writing abilities.

Course Contents to be developed by the respective institute as per the regional requirements

Unit 1: title to be described

Unit 2: title to be described

Unit 3: title to be described

Unit 4: title to be described

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

- to comprehend the reading passages at the end of semester.
- to show better assimilation in technical aspects of formal and informal communication.
- to demonstrate the ability of using lexicon in proper contexts.
- to potentiate their sociolinguistic competence.

References:

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Map Graphics and Presentation Techniques***
No. of Credits	*4 (L: 0; T: 0; P: 8)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the techniques of map preparation, mapping skills and map presentation.

Course Contents

The students are required to undertake practical exercises as follow:

Grade of lines, free hand sketching of solids, cones, cubes, cylinders, spheres; Free hand sketch of various settlement elements – electric poles, street features, trees, shrubs, bus stop physical natural features.

Basic elements of maps, components and presentation; Type of maps - study of large-scale, small-scale maps; Land use maps of cities (tracing of maps and understating of concept of scale); Scales: Simple Scale, Graphic Scale, Representative Fraction, Diagonal Scale, Vernier Scale.

Different theme maps census map series, geographical maps, components of working drawings of a site, buildings; Generation of theme maps from base map; Demonstration of use of statistical data on maps- pictographically, graph.

Preparation of a base of a city; Copying an existing map and Generating map from other sources; Land Use types, signs and symbols used for different types of maps; Map presentation with colors.

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

- to understand the basics of the map preparation process.
- to develop the skills of map preparation and map presentation.
- to develop the knowledge of preparing base maps and statistical data analysis techniques of maps.

References:

1. Strahler A.H. and Strahler A.N. (2001). Modern Physical Geography (Fourth Edition), John Wiley and Sons, Inc., New York.
2. Khullar D.R. (1999). Essentials of Practical Geography. New Academic Publishing Co., Jalandhar.
3. Singh R.L. and Rana P.B. (1998). Elements of Practical Geography. Kalyani Publishers, New Delhi.
4. Monkhouse and Willinson (1964). Maps and Diagrams. Methuen and Co., London.
5. Walton D.S. (2023). Urban Mapping Guide: Tips and Techniques. Thomas Telford Publishing, London.
6. Terry A. Slocum, Robert B. McMaster, Fritz C. Kessler, Hugh H. Howard (2023). Thematic Cartography and Geo-visualization. Taylor and Francis Group, London.
7. Monmonier M. (2022). Elemental Maps: Thematic Mapping in the 21st Century. Syracuse University, New York.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Enhancement***
Course Title	***Basic Mathematics**** ***(For the students who did not have mathematics in their 10+2 programme)***
No. of Credits	*Audit4 (L: 2; T: 0; P: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop proficiency in interpreting data, solving equations, and using functions in real-world planning contexts.
- to understand mathematical principles relevant to planning, spatial analysis, and decision-making.
- to apply mathematical tools in quantitative analysis, urban modelling, and infrastructure planning.
- to foster logical reasoning and structured thinking essential for urban systems modelling and policy evaluation.

Course Contents

Unit 1: Functions & Sets

Set theory and its applications in demographic and land-use classification; Functions and graphs: linear, polynomial, exponential, and logarithmic – relevance in population projections and growth models.

Unit 2: Algebra

Quadratic Equations; Linear Inequalities; Permutations and Combinations; Sequence and Series.

Unit 3: Geometry and Trigonometry

Coordinate geometry: use in site layout, land parceling, and spatial planning; Straight lines, slopes, and distances; application in transport networks; Trigonometric functions and identities.

Unit 4: Calculus

Limits and continuity – foundational concepts; Derivatives and rates of change: use in population dynamics, traffic flow, and urban expansion rates; Basics of integration: cumulative resource use, area under curves.

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

- apply mathematical methods to solve problems in urban, regional, and environmental planning.
- analyze and interpret planning data using algebraic, geometric, and statistical techniques.
- develop models for growth projections, land suitability, and infrastructure efficiency.

- use quantitative reasoning in planning proposals and development control strategies.
- enhance decision-making with a strong foundation in applied mathematics.

References:

1. Mathematics Textbook for Class XI, NCERT, New Delhi.
2. Mathematics Part I - Textbook for Class XII, NCERT, New Delhi.
3. Mathematics Part II - Textbook for Class XII, NCERT, New Delhi.
4. Mathematics Exemplar Problem for Class XI, NCERT, New Delhi.
5. Mathematics Exemplar Problem for Class XII, NCERT, New Delhi.
6. Mathematics Lab Manual Class XI, NCERT, New Delhi.
7. Mathematics Lab Manual Class XII, NCERT, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Ability Enhancement (AE)***
Course Title	***Communicative English*** ***(For the students who did not have english in their 10+2 programme)***
No. of Credits	*Audit (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

1. ***1.***
2. ***2.***

Course Contents to be developed by the respective institute as per the regional requirements

Unit 1: title to be described

Unit 2: title to be described

Unit 3: title to be described

Unit 4: title to be described

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

- to comprehend the reading passages at the end of semester.
- to show better assimilation in technical aspects of formal and informal communication.
- to demonstrate the ability of using lexicon in proper contexts.
- to potentiate their sociolinguistic competence.

References:

	Second Semester					
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Fundamentals of Planning	Major	2	1	0	3
	Site Surveying and Land Development	Minor	2	0	0	2
	Statistical Methods	Multi-Disciplinary	2	1	0	3
	Universal Human Values	Value Added	2	1	0	3
	Computer Fundamental for Spatial Planning	Skill Enhancement	0	0	6	3
	Communication and Writing Skills	Ability Enhancement	2	0	0	2
	Planning Studio: Area Appreciation (Urban and Rural)	Major	0	0	8	4
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Fundamentals of Planning***
No. of Credits	*3 (L: 2; T: 1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the basic concepts and rationales of planning, plan making processes, planning organizations, and theories of urbanization.

Course Contents

Unit 1: Basics in Planning

Definition and characteristics of rural and urban settlements as per census; Classification of towns, city, metropolis, megalopolis, interaction and interdependence between city-region; Benefits of planning; Goals, objectives and components of planning; Planning as a discipline and multidisciplinary nature of planning; Different roles of planners; Components of sustainable urban and regional development.

Unit 2: Dimensions of Planning

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 societal aspects as bases of town and country planning; Urbanization process: definition, character, function, role of social, economic and demographic aspects of urbanization, major components of a settlement, major urban problems and their solutions.

Unit 3: Participation, Governance, and Planning Models

Public Participation in Planning: History, significance, methods, and challenges; Advocacy and Equity Planning: Concepts, historical background, and implications for urban planning; Collaborative and Communicative Planning: Contributions of Patsy Healey and Judith Innes; Political Economy in Planning: Role of governance and the state in urban development; Trust, Power, and Conflict in Planning: Deliberative policy analysis and planning as persuasive storytelling.

Unit 4: Plan Preparation Process

Types of Plans: definition, types and scope of development plans, regional plan, master plan, zonal plan, town planning scheme, layout plan, structure plan, district plan, action area plan, subject plan; Hierarchy of plans and its significance; Planning Process: need and importance, function and type of planning, role of environment, society, economy, political, administrative and legal system in planning process;

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

- to demonstrate understanding about the fundamental concepts of urban and regional planning.
- to understand about the type of demographic data used in planning and different sources of collecting data.
- to develop knowledge about the planning process and different levels of planning.
- to understand the major urban issues and different solutions that can be adopted to tackle these issues.

References:

1. Branch M.C. (2018) Comprehensive City Planning: Introduction and Explanation. Routledge, London.
2. Keeble L. (1972). Principles & Practice of Town and Country Planning. The Estates Gazette Ltd., London.
3. Kulshrestha S.K. (2006). Dictionary of Urban and Regional Planning. Kalpaz Publications, Delhi.
4. MoUAE (G.O.I.) (2015). Urban Development Plans Formulation and Implementation Guidelines, New Delhi.
5. Thooyavan, K.R. (2005). Human Settlements: A Planning Guide to Beginners. M.A. Publications, Chennai.
6. Kaur Harneet (2023). Fundamentals and Principles of Urban and Regional Planning. Orange Books Publication, Bhilai.
7. Pumain D. (2020). Theories and Models of Urbanization. Springer Nature, Berlin.
8. Kumbhar A. (2024). Functional Classification of Towns. Orange Books Publication, Bhilai.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Site Surveying and Land Development***
No. of Credits	*2 (L: 2; T: 0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop basic understanding about land development with a particular focus on surveys, geology and hydrology.

Course Contents

Unit 1: Fundamentals of Surveying

This unit introduces the foundational principles of surveying, encompassing various types and classifications of surveys and maps. Students will learn to distinguish between plans and maps, understand accuracy versus precision, and identify sources and types of errors. The unit also covers key land surveying techniques, including chain surveying and levelling, and delves into modern instruments such as Electronic Distance Measurement (EDM) tools and Total Stations. Practical field procedures for topographic surveys using these instruments will be emphasized.

Unit 2: Topographical Surveying Concepts and GPS Techniques

Focusing on topographical surveying, this unit explores procedures for creating topographical maps and their applications. Topics include relief representation, contour characteristics, and methods for locating and interpolating contours. Students will also examine specific surveys like those for dam construction. The unit introduces the fundamentals of the Global Positioning System (GPS), including the use of various satellites, differential GPS, and practical applications using handheld GPS receivers.

Unit 3: Geology, Groundwater, and Geomorphology

This unit delves into geological structures, landforms, weathering processes, and mass wasting phenomena. It assesses terrain suitability for various developments, considering factors like earthquakes, seismic zoning, and disaster prevention. The hydrologic cycle is examined, focusing on groundwater properties, surface water dynamics, artificial recharge methods, and their implications for site selection and development. Additionally, the unit covers geomorphic classifications, the evolution of landforms, structural geology features such as folds and faults, and issues related to slope stability and landslide prevention.

Unit 4: Land Development Planning, Design, and Legal Aspects

The final unit integrates surveying knowledge into land development planning and design. Students will engage in site selection and analysis, considering topography, soil conditions, accessibility, and environmental impacts. The unit addresses land use planning, zoning laws, and sustainable development practices. Infrastructure design topics include planning for utilities, transportation networks, and drainage systems. Environmental impact assessments will be conducted to evaluate potential effects of development projects. Legal aspects such as property law, land ownership, regulatory compliance, and ethical considerations in surveying and land development will also be discussed.

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

- to show knowledge and skills about land surveys by actually conducting land surveys by using a range of methods and technologies.
- to demonstrate knowledge and skills about geological and hydrological aspects of land development.

References:

1. Beer A.R. and Higgins C. (2000). Environment Planning for Site Development: A manual for sustainable local planning and design. E and FN Spon, London.
2. Dewberry S.O. (2008). Land Development Handbook: Planning, Engineering, and Surveying. McGraw Hill, New York.
3. Syms P. (2010). Land Development and Design. Wiley, Oxford.
4. Dewberry (2023). Land Development Handbook. McGraw Hill, New York.
5. Garg P.K. (2023). Introduction to Surveying and Geomatics Engineering. CBS Publishers and Distributors Pvt. Ltd., Chennai.
6. Roy S.K. (2024). Fundamentals of Surveying. PHI Learning, New Delhi.
7. Gillins Daniel T., Michael L. Dennis, and Allan Y. Ng (2022). Surveying and Geomatic Engineering: Principles, Technologies, and Applications. ASCE Publications, Reston VA.

Course Code	*As per Institutional Policy*
Nature of Course	***Multi-Disciplinary (MD)***
Course Title	***Statistical Methods***
No. of Credits	*3 (L: 2; T: 1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- To understand types and forms of statistical means to derive out meaningful findings from urban & regional perspective.

Course Contents

Unit – I: Basic of Statistics and Sampling

Introduction to statistics – meaning, importance, scope and limitations; Collection of data – objectives, scope, sources; Methods of classification of data – functions, rules basis; Methods of tabulation of data – meaning, importance, prerequisites, types; Sampling – concepts, principles, types, designing sample surveys, sampling errors; Sampling Methods.

Unit – II: Measures of Statistics and Dispersion

Measures of central tendency - meaning and importance, arithmetic mean, median, mode; Measures of dispersion – meaning and importance, range, quartile deviations, mean deviation, standard-deviation, Lorenz curve; Importance and applications of measures of central tendency and measures of dispersion.

Unit – III: Correlation and Regression Analysis

Correlation analysis – meaning, importance, types - multiple and partial correlation; Methods of studying simple correlation - Scatter diagram, Karl Pearson's co-efficient of correlation, Spearman's rank correlation; Regression analysis - meaning and purpose of regression, types - simple and multiple linear regression; Methods and interpretations.

Unit – IV: Probability and Time Series

Theory of probability - meaning, importance and different terms; Theorems of probability – addition and multiplication; Time series analysis -meaning and importance, methods, graphs semi-averages, least squares, moving average, ratio to proportion.

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

- organize, manage and present data.
- analyze statistical data graphically.
- analyze statistical data using different statistical methods.

References

1. Gupta, S.P. (2009), Statistical Methods, 38th Ed., Jain Book Agency, New Delhi.
2. Gupta, S.C., (2006), Statistical Methods, Sultan Chand & Sons, New Delhi.
3. Sancheti, D.C. & V.K. Kapoor, (2001), Statistics Theory Methods& Application, Sultan Chand & Sons, New Delhi.
4. Goon, A. M., M. K. Gupta and B. Das Gupta, (2002), Fundamentals of Statistics, Vol. II, World Press, Calcutta.
5. Gupta, S.C. and V. K. Kapoor, (2010), Fundamentals of Mathematical Statistics, 11th Ed., Sultan Chand & Sons, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Value Added (VA)***
Course Title	***Universal Human Values and Ethics***
No. of Credits	*3 (L: 2; T: 1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- To appreciate the complementarity between 'values' and 'skills' to ensure sustained happiness and prosperity.
- To develop a holistic perspective towards life, profession, and the rest of existence.
- To understand ethical human conduct and a value-based way of living.
- To facilitate inner transformation through self-exploration and value education.

Course Contents

Unit 1: Value Education and Human Aspirations

Concept and need for value education; Self-exploration as a method; Understanding happiness and prosperity; Right understanding and role of education.

Unit 2: Harmony in the Human Being and Family

Co-existence of self and body; Needs and harmony between self and body; Harmony in the family; Trust, respect, and justice in relationships.

Unit 3: Harmony in Society and Nature

Understanding society and human order; Relationship with nature and ecological balance; Four orders of nature; Existence as co-existence

Unit 4: Holistic Living and Professional Ethics

Morals and Ethics; Human values in personal and professional life; Ethics in profession, education, and governance; Sustainable technologies and value-based work; Strategies for a value-based lifestyle

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

- understand the importance of values in personal, social, and professional contexts.
- practice self-awareness and develop critical thinking rooted in ethics.
- apply value-based approaches to decision-making and conflict resolution.
- demonstrate commitment toward sustainability, health, and responsible living.

References:

1. Jeevan Vidya (1999), Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar Kantak.
2. A.N. Tripathi (2004), Human Values, New Age International Publishers, New Delhi.
3. Economy of Permanence - J C Kumarappa
4. Bharat Mein Angreji Raj – Pandit Sunderlal
5. Rediscovering India - by Dharampal
6. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
7. India Wins Freedom - Maulana Abdul Kalam Azad
8. Vivekananda - Romain Rolland (English)
9. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
10. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak.
11. P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.
12. A N Tripathy, 2003, Human Values, New Age International Publishers.
13. B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
14. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Enhancement (SE)***

Course Title	***Computer Fundamentals for Spatial Planning***
No. of Credits	*3 (L: 0; T: 0; U: 6)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to equip the fundamental skills to apply computer-based relevant software, tools and technologies in spatial planning, which include spatial computing such as digital creation, spatial analysis, query, presentation and visualization of maps and built environment.

Course Contents

Unit 1: Computer Systems for Spatial Planning

Computer systems: mainframes, minicomputers, workstations, personal computers, servers, supercomputers, embedded systems, mobile systems, etc.; Hardware configuration suitable/ relevant for spatial computing: central processing unit, storage capacity, random access memory, processor, etc., including various input & output devices, computer peripherals, etc.; Software: various operating systems, spatial planning application software related to Computer Aided Design (CAD), Geographic Information Systems (GIS), visualization, etc.

Unit 2: Concepts of Spatial Data and Analysis

Geospatial data: relative geographic information, earth and its features, coordinate systems; Spatial data: raster data / remote sensing data (platforms, satellite data / imagery: pixel/ grid data, bands, resolution, stereo satellite data, digital elevation model) and vector data/ spatial data structures (points, lines, polygons, annotations); Non-spatial data - attribute data / data sets (cells, fields and records).; Spatial data creation and analysis: georeferencing, digitization, thematic modelling and layer management, overlay analysis – buffer, intersection, union, merge, clip, etc.; Data integration and visualization: linking spatial and non-spatial data (creation and joining of tables), data query, map charts/ graphs, presentation and visualization.

Unit 3: Basics of CAD and GIS

Introduction to CAD: open source and proprietary CAD software, basic skills (drawing, editing, layering), file formats and conversion, model and layout space, 2D and 3D drawings, basic CAD modelling and visualization skills (rendering, animation).; Introduction to GIS: open source (QGIS) and other proprietary software, store, manage, analyse, and display geographic data, enabling the creation of maps, scales, format conversions/ compatibility with various other applications.

Unit 4: Applications of Computer-Based Tools in Spatial Planning

Projects / exercise: urban and regional planning project / exercise of different scales (area / neighbourhood/ urban/ regional) through hands on practice / lab sessions.; C reation of various maps of different scales such as base maps, landuse maps, infrastructure and utility maps, transportation and mobility maps, etc.

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

- to understand the fundamental concepts of computer systems, software, and spatial analysis techniques
- to apply computer-based tools and technologies in spatial planning

References:

1. Bolstad P. (2019). GIS Fundamentals: A First Text on Geographic Information Systems. XanEdu, Livonia.
2. Kumar V. & S. Kumar (2020). Computer systems and architecture. Wiley India, New Delhi.
3. Tickoo S. (2023). Exploring AutoCAD Map 3D 2023 for GIS Engineers. BPB Publications, Delhi.
4. Wegman M., Jakob Schwalb-willmann, Stefan Dech (2020). An Introduction to Spatial Data Analysis: Remote Sensing and GIS with Open Source Software. Pelagic Publication Ltd., London.
5. Tanenbaum Andrew S., Herbert Bos (2024). Modern Operating Systems. Pearson Education, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Ability Enhancement (AE)***

Course Title	***Communication and Writing Skills***
No. of Credits	*2 (L: 2; T: 0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to write academic and technical reports on their field projects/ Master Plans, research projects, thesis etc.
- to learn review relevant literature, analyse field data and write the findings in a succinct manner.
- to learn academic publishing – including journals, magazines and op-eds
- to learn digital communication

Course Contents

Unit 1: Purpose of Writing in Planning – to inform, to explain, to persuade, to evaluate

Considering the audience, communicating your purpose, organising your writing: Introduction, analysis, conclusion, one idea per paragraph: organising ideas; Persuasive and argumentative writing: research papers; Common mistakes: circular arguments, addressing common grammatical mistakes.

Unit 2: Literature Review and Developing Arguments

Sources of literature; Abstract and synopsis writing; Different styles of referencing: Harvard, APA, MLA, Chicago; Using google scholar for literature search, difference between annotated bibliography and literature reviews; Framing research questions; Inductive and deductive reasoning, syllogism, enthymeme; Writing for journals, magazines and op-eds.

Unit 3: Technical Writing

Type of reports; Difference between technical, scientific, legal and other; Specific characteristics of writing technical reports; Preliminaries: contents, preface, acknowledgements, list of tables and figures; Key words and indexing, Content: introduction, sections and subsections, or chapters, conclusions and recommendations; 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.

Unit 4: Digital Communication

Introduction to digital tools and platforms: cloud, tableau, e-mails, blogs, social media, websites, others; Sources of digital communication: blog, videos, e-flyers, digital posters; Use of digital platforms for community outreach and participatory planning (e.g., surveys, public feedback); Using spell check and grammar software: Grammarly and AI: ChatGPT; Basics of virtual collaboration tools (Zoom, Teams, Trello, Miro).

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

- to do literature review for their topics, frame their research questions and objectives
- to organise their ideas for academic and technical report writing, develop analytical skills for communication and writing
- to master evidence-based writing skills, structure better sentences and paragraphs, write meaningful introductions and conclusions to their research papers and reports.

References:

1. Kulshrestha S.K. (2006). Dictionary of Urban and Regional Planning. Kalpaz Publications, New Delhi.
2. Greed Clara, (2004). Introducing Planning. Continuum, London.
3. Ministry of Urban Affairs & Employment (2014). Urban Development Plans Formulation and Implementation Guidelines. Government of India, New Delhi.
4. Sharma S. (2024). Mastering Communication and Professional Skills: From Reading to Writing. Book Enclave, Delhi.

5. Banerjee M., Dr. Kalpana Singh and Dr. Jyotika Rajawat (2023). A Concise Guide on Report Writing and Presentation Skills. Iterative International Publishers IIP, Chikmagalur.
6. Antipova T. (2025). Digital Technology Platforms and Deployment. Springer Nature, Berlin.
7. Simon P. (2021). Reimagining Collaboration: Slack, Microsoft Teams and Zoom. Motion Publishing, Melbourne.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio:*** ***Area Appreciation (Urban and Rural)***
No. of Credits	*4(L: 0; T:0; U: 8)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to conduct thorough analysis and assess site suitability for development and existing infrastructure integration.
- to design comprehensive physical, social and environmental infrastructure solutions and applying relevant planning guidelines and standards at a given area.

Course Contents

The exercise will cover the following aspects of Area Appreciation guided by the faculty: -

- Preliminary site investigation and analysis: -
    - Site inventory: topography, soil characteristics, site resources and physiographic conditions.
    - Site suitability for development – such as slope, drains, presence of trees, etc.
    - Site in relation to its surrounding and city/village level infrastructure lines.
    - The proposed layout and population distribution.
- General planning guidelines for the area, norms and standards, design considerations and concepts in relation to the area.
- Proposals for infrastructure: physical – water supply sewerage networks, drains, water and solar harvesting, street and street furniture, solid waste management; Social: - education, health, recreation, religious, community centers, special areas for the children, aged, women, and other privileged population requirements, etc.
- The plan will be presented in the form of presentation, report with necessary drawings, maps charts, diagrams, sketches, and photographs.

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

- to demonstrate effective site analysis and evaluation.
- to develop well-integrated and feasible infrastructure designs.
- to apply planning norms and standards accurately.
- to present infrastructure plans clearly and utilize site visit data to refine infrastructure proposals.

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

	Third Semester					
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Planning Theory	Major	2	1	0	3
	Planning for Utilities	Minor	2	0	0	2
	Land Economics and Real Estate Management	Minor	2	0	0	2
	Geographic Basis in Planning	Multi-Disciplinary	2	1	0	3
	Basics of Information Technology and Programming	Value Added	2	1	0	3
	Liberal Learning Courses	Skill Enhancement	2	0	0	2
	Planning Studio: Site Planning/Neighbourhood Planning	Major	0	0	10	5
	Total Credits					**20**

Note: ***<u>The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.</u>***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Theory***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the evolution and significance of planning theories.
- to analyse different planning models and their implications in urban development.
- to explore the relationship between planning theories and real-world urban and regional challenges.
- to develop a critical understanding of governance, sustainability, and equity in planning.

Course Contents

Unit 1: Introduction to Planning Theory and Paradigm Development

Definition and significance of planning theory; Types of planning theories: Theory of planning, theory in planning, and theory about planning; Paradigm shifts in planning: Kuhn's stages of paradigm development; Rationality in planning and its critiques; Role of theory in decision-making and policy formulation.

Unit 2: Theories and Global City

Theories of urbanization including Concentric Zone Theory, Sector Theory, Multiple Nuclei Theory and other latest theories; Land Use and Land Value Theory of William Alonso; Meanings and forms of globalization; Characteristics of a global city; Planning advisory, national level planning and design guidelines, development regulations; Planning and development authorities in India.

Unit 3: Sustainability, Globalization, and Theories of City Development

Sustainability and its relevance in planning; Components of sustainable urban and regional development; Globalization and its impact on urban planning and governance; Modernism and postmodernism in urban planning; Theories of city development: Compact city approach, smart growth, and new urbanism; Comparative analysis of urban forms in developed, developing, and socialist countries.

Unit 4: Planning, Implementation, and Evaluation

The relationship between planning, implementation, and evaluation; Planning theories and their role in evaluating urban development; Methods for evaluating development plans; Theories of implementation in planning policy and urban governance.; The role of planners in addressing urban challenges.

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

- to show knowledge of planning theories, and if possible, demonstrate application of these planning theories to Indian planning practices.
- to develop an understanding about the human development approach and its significance to urban and regional planning in India
- to develop a critical understanding of planning theories, their real-world applications, and their impact on urban governance, sustainability and equity.

References:

1. Alexander E.R. (2006). Evaluation in Planning: Evolution and Prospects. Routledge, London.
2. Jacobs J. (1961). The Death and Life of Great American Cities. Vintage Books, New York.
3. Sassen S. (2001). The Global City: New York, London and Tokyo. Princeton University Press, New Jersey.
4. Davidoff, P. (1965). Advocacy and Pluralism in Planning. Taylor & Francis, Oxfordshire.
5. Ward S. (2002). Planning the Twentieth Century City: The Advanced Capitalist World. John Wiley& Sons, England.
6. Beauregard Robert A. (2020). Advanced Introduction to Planning Theory. Edward Elgar Publishing, Cheltenham.
7. Uddi K., Bhuiyan Monwar Alam (2022). Public Participation Process in Urban Planning: Evaluation Approaches of Fairness and Effectiveness Criteria of Planning Advisory Committees. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Planning for Utilities***
No. of Credits	2 (L: 2; T: 0; P: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the role of planner in infrastructure planning and to introduce basics of urban and regional infrastructure planning.
- to give exposure for taking up innovative techniques for the provision of infrastructure.

Course Contents

Unit 1: Terminologies and Significance

Utilities: definition, terminologies and types; Historical perspectives of utilities; Significance of utilities in urban and regional planning; Sources of water: surface water, ground water; Collection and conveyance of water; Water treatment processes: plain sedimentation, sedimentation with coagulation, filtration, disinfection (excluding the design part).

Unit 2: Water and Drainage

Quality of water: types of water impurities and standards of water quality; Quantity of water: types of demand for various uses: domestic, industrial, commercial demand; Pumps, concept of hydrology, precipitation, rain and snowfall; Drainage system: determination of intensity of rainfall: frequency relationship, runoff and runoff losses; Factors affecting storm sewage, determination of maximum runoff of a locality, Quantity of storm sewage; Rain water harvesting; Reuse and recycling of water, recharge of water, desalination plants.

Unit 3: Sanitation and Solid Waste

Definitions of common terms in sanitary engineering; Systems of sanitation; Methods of collection; Conservancy and water carriage system; Quantity of sanitary sewage, methods of sewage disposal: dilution, land treatment, and treatment processes; Containment based Toilet Systems – disposal in un-sewered areas, privies, cesspools, septic tanks; Solid waste generation and disposal methods: sanitary land filling, vermicomposting, incineration; Best practices on in Indian context related to sewerage system; Solid waste management.

Unit 4: Electricity, Telecom and Gas System

Electricity design and renewables – renewable energy sources, telecommunication: internet, wireless systems, mobile network; gas network.

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

- to determine the insights of the techniques of infrastructure planning especially water supply, sewerage and drainage system and solid waste management
- to know the application of these skills and techniques while the preparation of different plans and projects at various scales

References:

1. Birdie G.S. (2012). Water Supply and Sanitary Engineering. Dhanpat Rai Publications, New Delhi.
1. CPHEEO (2000). Manual of Solid Waste Management System. Ministry of Housing and Urban Development, Government of India
2. Bureau of Indian Standards(2024). National Building Code of India 2024. Government of India, New Delhi.
3. Punmia, B.C. (2010). Waste Water Engineering. Laxmi Publications, New Delhi.
4. Rangwal, P.B. (2012). Water Supply and Sanitary Engineering (Environmental Engineering). Charotar Publishing House, New Delhi.
5. Proag Virendra (2021). Infrastructure Planning and Management: An Integrated Approach. Springer Nature, Berlin.
6. Jadhav Pravin and Rahul Nath Chaudhary (2024). Infrastructure Planning and Management in India: Opportunities and Challenges. Rawat Publications, New Delhi.
7. Srivastava P. (2023). Handbook of Research on Safe Disposal Methods of Municipal Solid Wastes for a Sustainable Environment. IGI Global, Hershey.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Land Economics and Real Estate Management***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand various types of land markets (formal and illegal), supply and demand equations, types of markets, and typology of land uses related to markets and their impact on spatial development.
- to give the tools for land management in urban and rural areas.

Course Contents

Unit 1: Introduction to Land Economics

Economic Principles of Land use; Real Estate Economy Types: Residential, Commercial, etc., Market: Types of Markets, Concept of Rent and its application; Demand forecasting for land and Real Estate, factors affecting land and real estate: supply and demand; Interpretation of Revenue Maps (Cadastral maps); Use of GIS Based Mapping and SVAMITVA for land titling, & Property Titling.; Market Conditions: formal and informal, legal and illegal by Markets; Instruments of land policy and impact on markets: Planning instruments, market development instruments, financial development instruments, fiscal instruments, and other supportive instruments; Market by Government and Government Regulation, monopoly power and its use, private development; Rent-seeking and its impact on land supply, access to land by various segments of population and PPP in land; Introduction to Resettlement & Rehabilitation (R&R).

Unit 2: Demand Side Management

Income elasticity of land, business cycles and its impact on demand for land; Externalities and internalities in land development and induced demand; Economic growth and demand for land; Changes in tastes and preferences and its effect on type of land; Poor and their demand; Physical, fiscal, financial and legal incentives for inducing or restricting the demand for land; Mega investments and its effect on land; Property Rights: ownership, user and exchange rights: Its implication on land supply; Land Development: Type, cost, methods of disposal; Corruption and land markets: Corruption, black money and land markets; Relation between land, share and gold markets.

Unit 3: Supply Side Management

Regulation in Land Markets: Social justice and land distribution: public domain, social- democratic regulation, corporatist regulation, collective action of the state and regulation of its supply of land; Overall impact of regulation on land prices: Master Plan, Zoning and other planning regulations and their impact on supply; Land conversions and its regulation/facilitation in peri-urban areas; Land utilization analysis; Common property and its use, tenancy and ownership, holding size and its relevance; Land Management Techniques: Private land assembly, TPS, co-operatives in land development, FDI in land development, land pooling and plot reconstitution, transfer of development rights, land sharing and land lease.

Unit 4: Land Pricing & Land Information System (LIS)

Land valuation techniques; Land pricing; Subsidies; Auctions; Type of development: plotted, flatted system, and their effect on land pricing; Hedonistic pricing; Land price behaviour in urban centres; Constructing the land price index; Government incentives for land supply, assembly and planned development; Sources of information for land information; Land records in Urban and Rural areas: GIS Based property valuation (Unit based pricing, zone based, etc.); Peri-urban areas (SVAMITVA) transparency in land transaction, methods of publicising land price monitoring.

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

- to assess land development by applying appropriate tools in the core and fringe areas of a city.

- to appreciate typology of markets, and methods to manage the land development for orderly spatial development.

References:

1. Pirounakis Nicholas G. (2012). Real Estate Economics a Point-to-point Handbook. Routledge, London.
2. Moss A. and Kieran Farelly (2024). Global Real Estate Capital Markets: Theory and Practice. Routledge, London.
3. Mohanty K.P. (2021). Land Economics and Policy in Developing Countries. Sage Publications Pvt. Ltd., London.
4. Burman Anirudh (2024). Land Markets. Carnegie India, New Delhi.
5. Nagarajaiah K.S. (2022). Principle and Practice for Valuation of Land and Building. K S Nagarajaiah.

Recommended Journals

1. Yavas A., B. W. Ambrose, J. B. Kau and R. K. Pace (2023). The Journal of Real Estate Finance and Economics. Springer Nature Link

Course Code	*As per Institutional Policy*
Nature of Course	***Multi-Disciplinary (MD)***
Course Title	***Geographic Basis in Planning***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objective: The student will be enabled

- to introduce students to the geographic concepts, principles, and techniques that underlie urban and regional planning
- to equip them with the skills to analyse and understand the spatial relationships between human settlements and their environment.

Course Contents

Unit 1: Introduction to Geographic Concepts

Overview of geographic concepts: location, place, human-environment interactions, natural resources, climate, terrain type, etc.; Main branches of geography and their broad coverage; Need and importance of geographic considerations in physical planning; Landforms their types and significance; The process of gradation, aggradations and degradation; Soil Profile: its characteristics and formation, classification of soil and their distribution in India.

Unit 2: Geography and Planning

Historic evolution of geographic-based planning, relationship between geography and planning; Planning for different geographic areas / regions such as plains, coastal areas, hilly areas, deserts, drought prone areas, etc.

Unit 3: Economic Geography

Economic geography of agglomeration; Defining development and under development through various economic geographic approaches; Growth and development indicators for rural and urban planning for various city and regional level plans.

Unit 4: Geographical Zones of India

Agro-ecological zones: 15 agro-ecological zones and 72 sub-zones; Coastal Regulation Zones (CRZ): CRZ-I, II, III, and IV for regulating developmental activities and protecting coastal areas.; Hill Area Development Programme (HADP); Special area development programs (SADP) and the Command Area Development Programme (CADP); Metropolitan region, peri-urban region.

Course Outcome: Upon completion of this course, students will be able

- to understand the geographic concepts/ land use theories and principles underlying urban and regional planning
- to evaluate the impacts of human settlements, and develop spatially informed planning strategies and solutions.

References:

1. Knox P.L. & Marston S.A. (2016). Human geography: Places and regions in global context. Pearson Education, London.
2. Macionis J.J. & Parrillo V.N. (2017). Cities and urban life. Routledge, London.
3. Oliveira V. (2024). ISUF, Urban Morphology and Human Settlements: Advances and Prospects. Springer Nature, Berlin.
4. Karnena M.K.(2021). Environmental Planning and Sustainable Development. Orange Books Publication, Kolkata.
5. Dave P. (2021). The Coastal Regulation Zone (CRZ) & The Island Protection Zone. Snow White Publications Pvt. Ltd., Mumbai.
6. Sharma Satish K. and Suman Lata Pathak (2024). Urbanization Population and Environment. Rawat Publications, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Multi-Disciplinary (MD)***
Course Title	***Fundamentals of Design***
No. of Credits	*3 (L: 2; T: 1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to introduce the basic concepts, elements, and principles of design relevant to urban planning.
- to develop an understanding of form, space, scale, proportion, and composition.
- to enhance creative thinking and visualization skills for designing functional urban spaces.
- to encourage critical analysis of existing urban environments and their design interventions.
- to apply design principles in basic projects focused on urban and community spaces.

Unit 1: Introduction to Design Principles and Elements

Understanding elements of design: line, shape, form, space, texture, color; Principles of design: balance, contrast, unity, rhythm, proportion.; Concepts of visual perception and human-centered design.; Importance of aesthetics and functionality in urban spaces.

Unit 2: Form, Space, and Composition

Exploring relationships between form and space (mass, void, solids, enclosures).; Spatial organization and composition techniques in urban design.; Understanding scale, proportion, and hierarchy in public space design.; Exercises in sketching, diagramming, and basic model-making.

Unit 3: Human-Centered Design and Behaviour in Spaces

Examining human behaviour in relation to spatial design.; Concepts of accessibility, safety, comfort, and inclusiveness.; Behavioural mapping and observational studies of public spaces.; Designing for diverse populations (age, gender, mobility, culture).; Case studies of successful human-centric public spaces.

Unit 4: Applied Design in Urban Contexts

Application of design principles in small-scale urban projects.; Design exercises for streetscapes, public plazas, parks, and community spaces.; Concepts of contextual design, environmental sustainability, and adaptive reuse.; Introduction to design presentation techniques (sketches, models, diagrams).; Final design project reflecting principles of urban design and user needs.

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

- to have strong foundation in design principles, enabling them to creatively and critically engage with urban environments
- to develop sustainable, inclusive, and functional urban spaces.

References:

1. Ching Francis D.K. (2007). Architecture: Form, Space, and Order. John Wiley & Sons, Inc., Hoboken, New Jersey.
2. Lynch K. (1964). The Image of the City. The MIT Press, Massachusetts.
3. Alexander C. (2015). A Pattern Language: Towns, Buildings, Construction. Oxford University Press, Oxford.
4. Jacobs J. (1992). The Death and Life of Great American Cities. Vintage, New York.
5. Dr. Friedman (2021). Fundamentals of Sustainable Urban Design. Springer, Berlin.
6. Black P. and Michael Martin (2024). Applied Urban Design: A Contextually Responsive Approach. Routledge, New York.
7. Wagner C. (2023). Visualizations of Urban Space: Digital Age, Aesthetics, and Politics. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Enhancement (SE)***
Course Title	***Basics of Information Technology and Programming***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to basic understanding of information technology
- to understand the fundamental programming concepts.

Course Contents

Unit 1: Introduction to Information Technology

Overview of Information Technology: Definition and Key Concepts, Importance and Applications of IT, and the Role of IT in Modern Industries.; Basics of the Internet and Computer Networks: Components of the TCP/IP Model, Internet Protocols (HTTP, HTTPS, FTP, DNS), Types of Networks (LAN, WAN, MAN), and Fundamentals of Network Security.; Basic and Advanced Input/Output Interfaces: Definition and Classification of Input/Output Devices, Advanced Interfaces (Voice Recognition, Sensors, IoT Interfaces), and Emerging Technologies (Virtual Reality (VR) and Augmented Reality (AR) Interfaces).

Unit 2: Basics of Programming

Introduction to Programming: Definition, Importance, Practical Applications.; Overview of Programming Languages: Python Basics, Debugging Process, Understanding Code Techniques; Writing Simple Programs: Variables, Data Types, Operators, Flow Diagrams, Code Analysis; Control Structures in Programming: Conditional Statements (if-else), Loops (for, while), Code Comprehension.; Functions in Programming: Functions, Role in Code Simplification, Reading and Debugging Functions.

Unit 3: Data Handling and Management

Introduction to Data: Definition, Types (Qualitative vs. Quantitative), Importance in Planning, Decision-Making.; Overview of Databases and Spreadsheets: Database Concepts, Excel Basics, Data Organization, Data Management.; Simple Data Entry and Retrieval: Data Handling, Extraction Techniques, Sorting, Filtering, Basic Formulas.; Basics of SQL: SQL database creation, Querying, Data Manipulation; Data Security and Privacy: Definition, Encryption & Decryption, Authentication & Authorization, Blockchain Security, Secure Data Storage, Data Protection Laws (GDPR, CCPA).

Unit 4: Emerging Technology

Introduction to Big Data: Definition, Characteristics (Volume, Variety, Velocity, Veracity), Applications.; Citizen Science: Concept, Real-World Applications.; Neural Networks: Fundamentals, Structure (Layers, Nodes, Weights), Applications in AI and Data Processing.; Smart Cities and Digital Planning Tools: Concept, Key Technologies (IoT, GIS, AI), Applications in Urban Planning, Case Studies.

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

- to understand basic concepts and their significance in planning.
- to write and execute simple python programs.
- to organize and handle data effectively.
- to gain foundational knowledge of emerging technologies.

References:

1. Rajaraman V. (2018). Fundamentals of Computers. PHI Learning Pvt. Ltd.
2. Silberschatz A., Korth, H. F., & Sudarshan, S. (2019). Database System Concepts. McGraw-Hill Education.
3. Downey A. B. (2016). Think Python: How to Think Like a Computer Scientist. O'Reilly Media.
4. Sinha P. K. & Sinha, P. (2004). Computer Fundamentals. BPB Publications.

5. R. Shambhavi Clinton Daniel and Manish Agrawal (2023). Fundamentals of Information Technology. University of South Florida, Florida.
6. Junior DG. (2023). Basics of Programming: A Comprehensive Guide for Beginners. Dg Junior, London.
7. Nayak S.K. (2022). Fundamentals of Data Management. VK Global Publications, New Delhi.
8. Singh H.S., Saurabh Ashwinikumar Dave, Balachandar Ramalingam and Om Goel (2024). Big Data Analytics: Techniques, Tools, and Applications. DeepMisti Publication, Sirsa.

Course Code	*As per Institutional Policy*
Nature of Course	***Ability Enhancement***
Course Title	***Liberal Learning Courses***
No. of Credits	2 (L: 2; T: 0; P: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

To be developed by the respective institute as per its regional requirement.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio – Site Planning/Neighbourhood Planning***
No. of Credits	*5 (L: 0; T: 0; P:10)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand land use planning principles and their application in site planning.
- to analyse different land uses beyond residential areas and assess their infrastructure requirements.
- to study residential neighbourhoods in terms of built form, evolution, ownership patterns, and supporting infrastructure.
- to apply primary and secondary data collection methods for assessing socio-economic conditions, activities, and infrastructure needs in neighbourhoods.

Course Contents

The students or groups thereof are required to prepare a site plan of an area. They are required to identify the various components to be provided within the site in the light of "Target Group" and surrounding development analysis. They are further required to identify characteristics and users of each of such components, their inter-relationships and most appropriate locations. They are required to do preliminary site investigation like topography, soil characteristics, slope, physiographic conditions, existing land use and analysis, site suitability for development, site in relation to the city and surrounding land use. Various aspects to be covered in this exercise are: literature review encompassing definitions, concepts, components, development of objectives, site planning and design considerations, norms and standards; The students are required to collect relevant data and work out requirements for the given site and prepare various plans, i.e., layout plans, circulation plan, utility plan and landscape plan etc. The students are expected to show creativity in their layouts while keeping norms and standards, target group, relationship of the site with surroundings and physical constraints in considerations.

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

- to balanced integration of theoretical knowledge, analytical skills, and practical application in site planning and neighbourhood analysis.

Note: <u>The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.</u>

References:

1. Lynch K. (1981). A Theory of Good City Form. MIT Press, Massachusetts.
2. Gallion A. and Eisner S. (1986). The Urban Pattern: City Planning and Design. Van Nostrand Reinhold, New York.
3. Town and Country Planning Organization (2015). Urban and Regional Development Plans Formulation and Implementation Guidelines (URDPFI). Ministry of Urban Development, Government of India.
4. Russ T. (2023). Site Planning and Design Handbook. McGraw-Hill Education, New York.
5. Banfield J. (2021). Neighbourhood Planning: Place, Space and Politics
6. Bradley Q., Amy Burnett and William Sparling (2022). Neighbourhood planning and the spatial practices of localism. Cambridge University Press, Cambridge.

	Fourth Semester					
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Transportation Planning - I	Major	2	1	0	3
	Housing	Major	2	1	0	3
	Landscape, Ecology and Resource Planning	Minor	2	0	0	2
	Geoinformatics and Data Analytics	Minor	2	0	0	2
	History and Culture of Local Area	Ability Enhancement	2	0	0	2
	Planning Studio: Village / Zonal Development Plan	Major	0	2	12	8
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Transportation Planning - I***
No. of Credits	3 (L: 2; T: 1; P: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the traffic and travel problems. issues and challenges, and importance of transport planning.
- to understand the importance of road users' behaviour and vehicular characteristics in designing different types of roads and intersections.
- to understand the traffic and transportation surveys, their relevance, analysis techniques, and importance in transportation planning process to prepare circulation and network management plans.

Course Contents

Unit 1: Basics of Transportation Planning

Meaning, scope and objectives of transportation planning and its importance in urban and regional planning; Transport planning, engineering and management; Traffic and travel characteristics; Relationship between traffic volume, concentration and speed; Significance of road user behaviour and vehicular characteristics in planning and designing of roads; Hierarchy of roads: regional and urban; Trip generation, distribution and assignment; Urban transport problems.

Unit 2: Design Elements and Capacity

Design capacity and level of service of roads and intersections; Cross sectional and longitudinal elements of urban roads; Intersections: types, design principles, alignment and vertical profile, visibility, radii of curves, channelization; Roundabouts: capacity and design; Grade separated intersection design elements: ramp gradient, acceleration and deceleration lanes, weaving sections; Capacity of signalized intersection; Road landscape design features.

Unit 3: Traffic Controls and Regulations

Traffic signs and marking: types, principles, design standards, location, height, maintenance, material and colour; traffic signals, warrant for signals, phasing and inter green period, saturation flow, optimization of signals, Vehicle actuated signal facilities, co-ordination of traffic signal, area traffic control system; Basic principles of regulation and its enforcement; Parking: types, designs, norms and planning considerations; Planning consideration, norms and designs of bus and truck terminals.

Unit 4: Transportation Planning Process

Transportation planning process: stages and surveys; Traffic surveys: volume count, origin- destination, speed and delay, parking and accidents surveys: their need, design of proforma, methods of conducting surveys, analysis, presentation and interpretation; Meaning, types and characteristics of transport systems including BRTS, LRTS, MRTS and NMTS in the urban and regional context; Land use Transport Integration.

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

- to identify traffic and transportation planning problems of a human settlement based on various traffic and transportation surveys and their interpretations.
- to show the ability to prepare circulation and traffic management plans for human settlements.

References:

1. Giuliano G. and Hanson S. (2017). The Geography of Urban Transportation. Fourth Edition, Guildford, London.
2. Kadiyali L.R. (1999). Traffic Engineering and Transport Planning. Khanna Publishers, New Delhi.

3. Pande, Anurag and Brian Wolshon (2016). Traffic Engineering Handbook. Seventh Edition, Institute of Transportation Engineers, New Delhi.
4. Ministry of Road Transport & Highways (2015). Road Safety Signage & Signs. Government of India, New Delhi.
5. Joshi G.J., Pradip Kumar Sarkar, Vinay Maitri (2022). Transportation Planning: Principles, Practices and Policies. PHI Learning, New Delhi.
6. Boada B.L. (2021). Intelligent Transportation Systems (ITS). MDPI, Basel.
7. Tiwari G., Dinesh Mohan, Girish Agrawal (2021). Transport Planning and Traffic Safety: Making Cities, Roads, and Vehicles Safer. Routledge, London.
8. Mepham D. (2024). Rethinking Parking: Planning and Urban Design Perspectives. Taylor & Francis Group, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Housing***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the housing components and planning the housing areas in the city accordingly.
- to examine the nature of housing problems, and various programmes and policies initiated to deal with these problems in Indian cities.

Course Contents

Unit 1: Concepts and Definitions

Shelter as a basic requirement; Understanding of housing components (to includes space, physical and social infrastructure, location, tenure and socio-economic compatibility); Determinants of housing form; Census of India definitions related to housing (to include dilapidation, structural conditions, materials of constructions, housing age, occupancy rate, crowding, housing shortage, income and affordability, poverty and slums, houseless population); Various housing typologies (to include traditional houses, plotted development, group housing, multi-storied housing, villas, chawls, etc., slums and squatters, night shelters); Public health issues related to housing.

Unit 2: Social and Economics Dimensions

Social and economic theories of housing; Housing as social security; Role of housing in development of family and community well-being, status and prestige related to housing, safety, crime and insecurity, deprivation and social vulnerability, ghettoism, gender issues, housing and the elderly; Contribution of housing to micro and macro economy; Contribution to national wealth and GDP, housing taxation, national budgets, fiscal concessions, forward and backward linkages; Housing need, demand and supply

Unit 3: Housing and the City

Understanding housing as an important land use component of city plan / master plan, considerations for carrying out city level housing studies, projections, land use provisions; Suitability of land for housing, housing stress identification, projecting housing requirements, calculating housing shortages, housing allocation.

Unit 4: Planning and Neighbourhoods

Approaches to neighbourhood living in traditional and contemporary societies; Elements of neighbourhood structure; Planning and design criteria for modern neighbourhoods; Norms and criteria for area distribution; Housing and area planning standards; Net residential density and gross residential density; Development controls and promotional rules, UDPFI guidelines, NBC 2005 provisions; Case studies of neighbourhood planning.

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

- to investigate and analyse the nature of housing problem in India
- to evaluate of housing policy and programmes in India.

References:

1. Kulshrestha S.K. (2006). Dictionary of Urban and Regional Planning. Kalpaz Publications, New Delhi.
2. Ministry of Urban Affairs & Employment (2014). Urban Development Plans Formulation and Implementation Guidelines. Government of India, New Delhi.
3. Aldrich B.C and R.S. Sandhu (2015). Housing for the Urban Poor in Developing Countries. Rawat Publications, Jaipur.
4. Banarjee A.V and E. Duflo. (2013). Poor Economics. Random House Limited, London.

5. Jain A.K. (2019). Housing for All. Khanna Book Publishing Co., New Delhi.
6. Rees Geneth and Chloe Roberts (2024). Housing: Architecture and Urban Planning. Knowledge Baker, Greater Noida.
7. Jill G. (2022). Planning the Good Community. Taylor and Francis Ltd, London.
8. Sengupta Urmi, Annapurna Shaw and Debolina Kundu (2024). Housing India: Programmes, Policies and Governance. Routledge, London.

Recommended Journals:

1. Ruonavaara H. (1998). Housing Theory and Society. Taylor and Francis Online.
2. Çelik Özlem, Andrew Clarke, Rory Coulter and Damian Collins (2018). Journal of Housing Studies. Taylor and Francis Online.
3. Boelhouwer Peter J. and Queena Qian (2023). Journal of Housing and Built Environment. Springer

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Landscape, Ecology and Resource Planning***
No. of Credits	*2 (L:2; T:0; U:0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the landscape, resource planning and ecology while examining the effects of spatial pattern and scale of ecological processes that unfold over areas of several square kilometres or larger.
- to understand landscape, ecology and resource planning providing many concepts, tools, and approaches that will enhance the effectiveness of endeavours such as watershed management, ecosystem management, design of conservation reserves and green infrastructure, and growth coherent with the landscape, ecology and ecological resources.

Course Contents

Unit 1: Concepts and Elements

Introduction to Landscape ecology; its scope, concepts of scale & hierarchy, resolutions, extent and mapping units; Landscape elements: patch; pattern and processes; Gradient concept of landscapes; Types of landscape: cultural, ecological, aesthetic, geological and biological and other related landscapes.

Unit 2: Analysis and Interpretation of Ecological Data

Interpretation of Landscape Data and Analysis (Remote Sensing and GIS); Quantifying patterns; concept of landscape metrics and interpretation; calculation of metrics; Spatial statistics: Analysing the spatial arrangement of ecosystems and how these patterns influence ecological processes, such as species distribution, migration, and habitat connectivity.

Unit 3: Impacts of Human Activities

Examining the influence of human activities on landscapes and how these interactions can affect ecological processes and resource management. Causes and Consequences of Landscape Pattern (Agents of patterns: Physical and biotic processes, disturbances; Temporal pattern dynamics, causes: Land use, land use change and forestry (LULUCF), social and cultural processes; Effects: Fragmentation, edge effects, connectivity, invasion, human-wildlife conflicts (elephant, tiger, rhino and other corridors).

Unit 4: Landscape, Ecology and Resource Planning Principles and Development

Applying landscape, ecology and resource planning principles to address real-world problems pertaining to city master plan or regional plan development/revision, linear projects (roads, highways, waterways); Development close to natural reserves, resource management, conservation planning, and sustainable development; Carrying out vulnerability assessments for varied landscapes and other related landscapes.

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

- to understand a firm grasp of the concepts of landscape, ecology and resource planning
- to enhance the effectiveness of environmental policy, management, regulation, and assessment.

References:

1. Turner M. G., Gardner R. H., & O'neill, R. V. (2001). Landscape ecology in theory and practice. Springer, New York.
2. Gergel S. E., & Turner, M. G. (2006). Learning landscape ecology: a practical guide to concepts and techniques. Springer, Berlin.

3. Longley P.A., Goodchild M.F., Maguire D.J. and Rhind D.W. (2005). Geographic Information Systems and Science. Wiley, Chichester.
4. Roy P.S. (2003). Geo-informatics for Tropical Ecosystems. M/s Bishen Singh Mahendra Pal Singh, Dehradun.
5. Turner Monica G. and Gardner Robert H. (2021). Landscape Ecology in Theory and Practice. Springer-Verlag New York Inc., New York.
6. Mustak S.K., Dharmaveer Singh, Prashant Kumar Srivastava (2023). Advanced Remote Sensing for Urban and Landscape Ecology. Springer, Berlin.
7. Urban Dean L. (2023). Agents and Implications of Landscape Pattern. Springer Nature, Berlin.
8. Moharir K. and Chaitanya B. Pande (2025). Remote Sensing and GIS Application in Forest Conservation Planning. Springer, Berlin.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Geoinformatics and Data Analytics***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to get fundamental knowledge of geo-informatics, GIS tools, and data analytics
- to support decision-making and spatial planning effectively.

Course Contents

Unit 1: Introduction to Geo-Informatics

Definition and Importance of Geo-Informatics: Overview of Geo-Informatics, its significance, and key applications.; Basics of Cartography and Map Interpretation: Principles of cartography, map elements, coordinate systems, and techniques for reading and analyzing maps.; Introduction to GIS Software: Overview of commonly used GIS software, including ArcGIS and QGIS; Remote Sensing, and Spatial Data Infrastructure (SDI): Basics of remote sensing, sources of geospatial data, and the role of SDI in spatial planning.

Unit 2: Data Handling and Processing

Urban Data: Taxonomy of urban data, Spatial data (vector and raster), and non-spatial (attribute) data; Data Aggregation: Methods of data collection, including satellite imagery, GPS, UAVs, crowdsourced data, surveys, and government databases; assessing data quality; Data Preprocessing: Techniques for cleaning, formatting, and preparing data for analysis.

Unit 3: Statistical and Spatial Analysis

Fundamentals of Data Analytics: Descriptive, Predictive, and Prescriptive Analytics; Statistical Analysis Techniques: Descriptive statistics (mean, median, mode, etc.), inferential statistics (regression analysis, hypothesis testing), analysis tools (R, Python); Spatial Data Analysis: Spatial analysis techniques (buffering, overlay, network analysis), introduction to supervised and unsupervised classification; Data Visualization Techniques: Fundamental principles of data visualization, tools, and techniques for effectively representing spatial and non-spatial data.

Unit 4: Applications of Geo-Informatics in Planning

Real-world Applications: Urban Planning, Environment, and Disaster Management; Geospatial Data for Decision-Making: Basics of geospatial intelligence in planning and policy-making; Web GIS and Online Mapping: Introduction to web-based GIS platforms and interactive mapping tools.; Hands-on Mini Project: Simple Spatial Data Analysis and Visualization

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

- to understand the fundamentals of geo-informatics and its significance in spatial planning.
- to apply basic data analytics techniques to planning-related datasets.
- to conduct spatial data visualization and interpretation for informed decision-making.
- to perform spatial analysis using GIS software for real-world applications.

References:

1. Cressie N. (2015). Statistics for spatial data. John Wiley & Sons, New Jersey.
2. Kalita N. and A.K. Bora (2025). Geo-informatics: Theory and Practice. EBH Publishers, Guwahati.
3. Chang K. (2019). Introduction to Geographic Information Systems. McGraw-Hill Education, New York.
4. Dr. Kler R. (2022). Data Processing and Management. Book Rivers, Lucknow.
5. Kumar M., and Akash Tiwari (2023). Geographic Information Systems in Urban Planning and Management. Springer, Berlin.

Course Code	*As per Institutional Policy*
Nature of Course	***Ability Enhancement (AE)***
Course Title	***History and Culture of Local Area***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

To be developed by the respective institute as per its regional requirement.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Zonal Development Plan***
No. of Credits	8 (L: 0; T: 0; P: 16)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to apply the concepts learnt in theory.
- to understand the link between the site level and city level plans.
- to understand the inter-relations amongst different sectors at the city level and how these need to be translated through detail plans so as to achieve master plan objectives.

Course Contents

Zonal Development Plan is prepared to detail out the land allocations and planning proposals at the city level. The plan proposes to study and development of the relevant planning standards for different land uses and proposed in the Master Plan of a city; Detailing of specific sites in the proposed zonal plans, covering different land uses; preparation of detailed project reports.

The plan will be based on various considerations for site layout, conceptual approach to site planning preparation of preliminary layout and area analysis. Final layout will describe the circulation, basic infrastructure, and the development controls and regulations with respect to the proposed land uses for the zone in the Master Plan along with detailed report.

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

- to show knowledge about the hierarchy of plans and their purposes.
- to show knowledge about reading and interpreting Master Plan proposals for different zones of the city.
- to generate information across sectors and levels in order to develop proposals in the form of a local area plan.

References:

1. Branch, M.C. (2018). Comprehensive City Planning: Introduction and Explanation. Routledge, New York.
2. Keeble, L. (1972). Principles & Practice of Town and Country Planning. The Estates Gazette Ltd., London.
3. Ministry of Urban Affairs & Employment (G.O.I.) (2015). Urban Development Plans Formulation and Implementation Guidelines, New Delhi.
4. Ministry of Urban Development (2016). Model Building Byelaws. Government of India, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Development (SD)***
Course Title	***INTERNSHIP (8 WEEKS)*** *(to be undertaken during the summer vocations for 8 weeks after the fourth semester by the student who opts to exit after the fourth semester. Its credits will be added over and above the total credits of the fourth semester)*
No. of Credits	*4 (L:-0; T:-0; U:-8)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to get exposed the current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/ Development Authority/Academics/NGOs.

Course Contents

Knowledge on current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/ Development Authority/Academics/NGOs.

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

- to get the current knowledge in the field of urban/metro region planning, projects, etc.

Fifth Semester						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Transportation Planning - II	Major	2	1	0	3
	Regional Planning	Major	2	1	0	3
	Estimation, Specification and Valuation	Minor	2	0	0	2
	Planning for Stampede Prone Areas	Minor	2	0	0	2
	Climate Change and Sustainable Development	Minor	2	0	0	2
	Planning Studio- Master Plan/ Development Plan	Major	0	2	12	8
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Transportation Planning - II***
No. of Credits	3 (L: 2; T: 1; P: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand types, form and components of urban and regional transport systems.
- to study transport policy and transport economics for urban and regional transport systems.

Course Contents

Unit 1: Urban Form and Transportation System

Urban form and transport systems; Impact of land use on transport and vice versa; Transport and quality of life planning for transport in cities and towns; Data requirements and planning techniques, travel behaviour and its determinants: Choice modelling, influencing travel behaviour, land use transport models for cities; Provision of new mass transit in cities; Specific challenges of small towns and big cities; Roles and responsibilities of various agencies; Provision for freight transport.

Unit 2: Regional Transport Planning

Planning for regional transport systems; Data requirements and planning techniques; Importance of accessibility in regional transport planning; Indicators of accessibility to basic services; Planning parameters for road, rail, air and water transport systems; Locational parameters for regional transport nodes; Roles and responsibilities of various agencies.

Unit 3: Transport Pricing

Pricing and funding of transport services and systems; Socio-economic appraisal of transport projects; Techniques for estimating direct and indirect road user costs benefits; Monetization of costs and benefits; Investment criteria and public private partnerships in the transport sector.

Unit 4: Transport Policies

Current Transport Policy in India; Evolution of transport policy in India; European, American and Asian Perspective on Transport Policy; Interactions between transport and other policy areas; Land-use transport policy: translation of national policy to city and local level plans.

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

- to analyse and evaluate critically issues and problems related to urban and regional transport systems.
- to address these issues through policy and financial resource planning for implementation of effective transport plans and projects.

References:

1. Chris N. (2015). Handbook of Research Methods and Applications in Transport Economics and Policy. Edward Elgar Publishing Ltd, Cheltenham.
2. Stopher P. and Stanley J. (2014). Introduction to Transport Policy: A Public Policy View. Edward Elgar Publishing Ltd., Northampton.
3. Ministry of Urban Development (2016). National Urban Transport Policy. Government of India, New Delhi.
4. Boukachour J., Abdelhamid Benaini (2023). Transport and Logistics Planning and Optimization. IGI Global, Pennsylvania.
5. Tirachini A., Daniel Horcher and Erik T. Verhoef (2023). Handbook on Transport Pricing and Financing. Edward Elgar Publishing, Cheltenham.
6. Hakim S., Robert M. Clark and Erwin A. Blackstone (2022). Handbook on Public Private Partnerships in Transportation. Springer Nature, Berlin.

Course code	*As per institutional policy*
Nature of course	***Major***
Course Title	***Regional Planning***
No. of Credits	*3 (L: 2; T: 1; P: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the typology of regions and regions in India and the regional dynamics.
- to understand special regions in India and the planning process and management in these areas.
- to understand the inequalities between regions and the ways of minimising the inequalities through indices.

Course Contents

Unit 1: Concepts and Typology of Regions

Basic Concepts in Regions, Defining a region: fluidity and purposiveness, Typology of Regions: Resource Regions, Mega, Macro, Meso, and Micro Regions; Use of clusters in regional planning; Delineation of Regions (Regionalisation); Concept of Global city regions, city beyond region.

Unit 2: Regional Dynamics

Growth of Mega and Metro Regions: Scale, Complexity and its impact on national and international scenario, convergence and divergence. International Regions: SAARC, BRICS, Latino Region, EU Region, etc.; Regional Economy, competitiveness among regions, backward and leading regions in development. Special Regions: SEZ, Agro Regions, Ecological regions, Investment Regions, etc.; Regional Disparity Analysis (through factor analysis); Regional Interdependence Analysis (through Input- Output model).

Unit 3: Regions in India and its Planning

Resource Regions; Corridors as regions; National, Sub-National, State, sub-state level (District), Blocks and Clusters as a region; Macro, Meso and Micro regions in India; Case Studies from India: NCR and Delhi Mega Region, Mumbai Mega Region, Kolkata Metro Region, Chennai Metro Region, and other Metro Regions in India; Western & Eastern Ghats, North Eastern Region, Coastal Regions, and River Valley; Regions; Corridors: Golden Quadrilateral, Delhi-Mumbai, Chennai-Bangalore Industrial Corridor, North-South and East- West Corridor Regions; Core, Fringe and Periphery in a Region and its planning; Tools and techniques available for planning regions in India: metro, mega, port, corridor, peri-urban regions, and District as Region; Role of 73 and 74 CAA in regional plan preparation and implementation.

Unit 4: Spatial Inequalities and Regional Disparities

Indexing Spatial Disparities/Inequalities: District Development Product, State Development Product, and National GDP; Human Development Index, Infrastructure Index, Environmental Index, Social Development Index, and Fiscal Transfers based on Indices; Overcoming inequalities: Spatial, economic, social, infrastructure, governance, etc. Tools and incentives used for balancing the development. Sectoral push, Investment Regions, etc.; Use of Thermal Imageries and Satellite Imageries for assessing inequalities over space.

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

- to appreciate tools and indicators to be used in regional planning.
- to appreciate the programmes and projects associated with various types of regions in India.

References:

1. Rengasamy S. (2009). Types of Regions and Regionalization of India. Madurai Institute of Social Sciences.
2. Department of Town and Country Planning (2005). Decentralised Development Plan. Government of Kerala, Thiruvananthapuram.

3. GIZ (2018). Regional Development Guidelines: Urban Vertical, Technical Collaboration with Government of India & Germany, New Delhi.
4. The World Bank (2009). New Economic Geography. Washington DC.
5. Board N.C.R.P. Regional Plan (2021). National Capital Region. Government of India, New Delhi.
6. Ministry of Panchayati Raj. (2021). Rural Area Development, Formulation, Policy. Government of India.
7. Jiwan J. (2021). Regional Development and Planning. Rawat Publications, New Delhi.
8. Dr. Ghosh T.K. and Dr. Satyen Sarkar (2022). Regional Disparities in Economic Development: Policies and Prospects for Balanced Development. Serials Publications Pvt. Ltd., New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Estimation, Specification and Valuation***
No. of Credits	2 (L: 2; T: 0; U: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand estimation of cost and impact of specification and validation in planning projects.

Course Contents

Unit 1: Concepts and Definitions

Definition, scope and importance of estimation; Units, method of estimating; Items of work in a building; Units of measurements and payments for various items of work; Methods of building estimate; Building estimate problems for one or two room buildings.

Unit 2: Types of Estimates

Types of estimates: preliminary, plinth area, cube rate, approximate quantity, detailed, revised, supplementary, repair/maintenance estimates; Contingencies, administrative approval, quantity survey; Concept of analysis of rates, overhead cost, task out-turn, labour requirement; Problems of analysis of rates.

Unit 3: Specifications

Specifications: concepts, general vs. detailed specifications; Specifications for earthwork, brickwork in wall, cement concrete, RCC, cement concrete floor, white washing, water supply network, sewerage network, horticulture/landscaping, roads.

Unit 4: Valuation

Concept of value and valuation; Purpose of valuation; Income vs. Expenditure; Various types of values of a building: scrap value, salvage value, market value, book value, rateable value, capitalized value, year's purchase, annuity, sinking fund, depreciation, obsolescence; Methods of valuation of a building; Fixation of rent.

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

- to handle planning projects with greater understanding of costs involved and make decisions that can make projects cost efficient.
- to understand the effect of specification on various planning projects in terms of cost.
- to do the valuation of planning projects by applying various valuation techniques.

References:

1. Dutta B.N., (2016). Estimating and Costing in Civil Engineering. UBS Publishers Distributors Ltd., New Delhi.
2. Birdie G.S. (2010). Water Supply and Sanitary Engineering. Dhanpat Rai Publishing Company, New Delhi.
3. Singh Gurcharan and Jagdish Singh (2004). Estimating, Costing &Valuation. Standard Publishers, Delhi.
4. Public Works Department (2008). Common Schedule of Rate. Government of Punjab.
5. Dr. Rethaliya R.P., Mayur R. Rethaliya and Piyush R. Rethaliya (2023). Estimating, Costing & Valuation. Atul Prakashan, Ahmedabad.
6. Dutta B.N. (2021). Estimating and Costing in Civil Engineering: Theory and Practice. CBC, New Delhi.
7. Rangwala (2023). Estimating, Costing and Valuation. Charotar Publication, Anand.
8. Shapiro E., David Mackmin, Gary Sams (2020). Modern Methods of Valuation, Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	**Planning for Stampede Prone Areas**
No. of Credits	2 (L: 2; T: 0; U: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

a) To learn to plan and design the major events (religious, sports, music, etc) occur with the organisers/event managers.
b) To understand and prepare a mitigation plan for the events and plan for infrastructure (physical, health, social and other infrastructure).
c) To manage the crowd management in advance using internet of things, machine learning and other tools.
d) To make provisions using the IoT, crowd sources, and other methods for preparedness for prone stampede areas.

Course Contents

Unit 1: Introduction to Stampede Risks

Overview of crowd dynamics and stampede incidents in India; Historical case studies of stampedes in high density areas; Social, cultural, and logistical challenges in managing large gatherings.

Unit 2: Basics of Crowd Management and Safety

Principles of crowd psychology, behaviour and control; Safety regulations and standards for mass gatherings; Role of emergency response planning in the crowded areas.

Unit 3: Town Planning and Infrastructure Design for Crowd Safety

Urban planning principles and tools in handling crowded zones; Designing access and exit routes to optimize flow; Planning crowd holding areas, waiting zones, and emergency evacuation routes; Infrastructure considerations: barriers, signage, lighting, and surveillance.

Unit 4: Introduction to Internet of Things (IoT) in Crowd Management

Basics of IoT and its applications in public safety: real-time monitoring, and analytics for crowd control; Sensors and devices: crowd density sensors, motion detectors, environmental monitors; Use of wearable devices and mobile apps for crowd tracking and communication; Integration of IoT data with emergency response systems; Case studies of successful IoT applications in public event management.

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

To undertake the mitigation planning for stampede prone areas using kind of planning standards, precautions, tools, use of Internet of Things, Machine Learning, and other tools.

References:

1. Alhadhira Ahmed Abdullah (2024). 'Human Stampede'. In Coittone's Disaster Medicine, 3rd Edition, pp. 947-954. ScienceDirect.
2. Almutairi, M. M. (2024). A Framework for Efficient Crowd Management with Modern Technologies. (Unpublished Doctoral thesis, City, University of London)
3. Arun Dharmanayagam Rethnasamy, Christopher Columbus Chinnapan, Bhuvanesh Ananthan, and Sumithra Alagar Samy (2024). 'Smart Crowd Monitoring System using IoT-Based Yolo-Ghost', in RRoum. Science Technology-Electronotechn, et Energ. Vol69. 3, pp.341-346. Bucarest.
4. Bolia, NB, editor (2015). 'Risk Management Strategies to Avoid Stampede at Mass Gatherings. 2nd World Conference on Disaster Management'. Visakhapatnam, Andhra Pradesh, India.
5. Burkle, FM Jr., Hsu, EB. (2011). 'Ram Janki Temple. understanding human Stampedes'. Lancet. 377 (9760).106-107.
6. Chang Alexander H, Wang Soon-Joo, Anandjiwala Aakash and Hsu Edbert (2024). 'A Crowd Disaster Study. The Itaewon Seoul Crush'. In Cureus, Springer.

7. Deshpande, N, Gupta, R. (2010). 'Crowd management using Fuzzy Logic and GIS'. WIT Transactions on Information and Communication Technologies. 43.325-334.
8. Drury, J, Novelli, D, Stott, C. (2015).'Managing to Avert Disaster. Explaining Collective Resilience at an Outdoor Music Event'. European Journal of Social Psychology. 45(4).533-547.Google Scholar
9. Duan Jiexiong, Zhai Weixin and Cheng Chengqi (2020). 'Crowd Detection in Mass Gatherings based on Social Media Data. a Case Study of the 2014 Shanghai New Year's Eve Stampede'. In International Journal of Environmental Research and Public Health. 17, 8640; doi.10.3390/ijerph17228640 .
10. Gayathri, H, Aparna PM, and Verma Ashish (2017). 'A Review of Studies on Understanding Crowd Dynamics in the Context of Safety in Mass Religious Gatherings'. In International Journal of Disaster Risk Reduction, Vol.25. Oct.2027. pp.82-91.
11. Greenough, PG. (2013).'The Kumbh Mela Stampede. Disaster Preparedness must Bridge Jurisdictions'. BMJ. 346. f3254.
12. Ha Kyoo-Man (2024). 'Crowd Stampede Management at Sporting Events. A Systematic Literature Review', in the journal of Movement and Sport Sciences – Science & Motricite. Vol.125. pp.17-26.
13. Harikrishnan R, Mugdha Thanawala, Samiksha Shukla, Harshvardhan Upadhyay, Sayed Atharabbas and Vishwak Chella (2023). 'IoT Based Crowd Detection and Stampede Avoidance using Predictive Analysis'. In International Conference on Artificial Intelligence and Knowledge Discovery in Concurrent Engineering (ICECONF). Symbiosis Deemed University, Pune.
14. Illiyas T Faisel, Mani K Shibu, Pradeepkumar AP, and Mohan Keshav (2013). 'Human Stampedes during Religious Festivals. A Comparative Review of Mass Gathering Emergencies in India'. In International Journal of Disaster Risk Reduction', Vol 5. Pp10-18.
15. Jain, A. (2014). 'Crowd Management at Heritage Sites.' In. We Can Not Leave Everything to God. Children and C.rowd Management in Schools. Southasiadisasters.net. (107).10-11.
16. Kasthala, S, Lakra, HS, (editors) (2015).'Disaster Preparedness for Mass Religious Gatherings in India-Learning from Case Studies'. Second World Congress on Disaster Management.
17. Kolli, S. (2014). 'Multi-Agent Management of Crowds to Avoid Stampedes in Long Queues. Hyderabad, India'. International Institute of Information Technology Hyderabad.
18. Koshnicharova Dessislava, Nidhi, Mihovska Albena, Koleva Pavlina and Vladimir Poulkov (2022). ' Data-driven Interactive Crowd Management Systems for Metaverse Scenarios', in 25th International Symposium on Wireless Personal Multimedia Conference.
19. Lee, RSC, Hughes, RL (2007). 'Minimization of the Risk of Trampling in a Crowd. Mathematics and Computers in Simulation (MATCOM)'. 74(1).29-37.
20. Menglong, L, Hongjian, P, Xinkang, Z, Luoping, D. (2012). 'Research on Risk Assessment System of Mass Crowded Stampede-Trampling Accidents in Stadium'. Appl Math. 6(1S).9S-14S.
21. modern technologies. (Unpublished Doctoral thesis, City, University of London)
22. Pin, SC, Haron, F, Sarmady, S, Talib, AZ, Khader, AT. (2011).' Applying TRIZ principles in crowd management'. Safety Science. 49(2). 286-291.
23. Prasun, A, Dixit, P, (editors) (2015).'Stampede Management for Religious Events in India'. Thailand. International Conference on Disaster Management in Civil Engineering.
24. Sharma Avinash, McCloskey Brian, Hui S David, Rambia Aayushi, and Zumla Adam, Traore T, Shafi Shuja, Azhar Serif, Alimuddin Zumla, and others (2023). 'Global Mass Gathering Events and Deaths Due to Crowd Surge, Stampedes, Crush and Physical Injuries – Lessons from the Seoul Halloween and other Disasters', in Travel Medicine and Infectious Disease 52. No. 102524.
25. Soomaroo, L, Murray, V. (2012). Disasters at Mass Gatherings - Lessons from History. PLoS Curr. 4.RRN1301.
26. Vanumu Devi Lakshmi, Laxmikant, and Rao Ramanchra K (2018). 'Human Stampedes at Mass Gatherings - An overview', in the Proceedings from the 9th International Conference on Pedestrian and Evacuation Dynamics. Lund Sweden. August 21-23.
27. Wieringa, SH. (2015). 'Planning Safe Pedestrian Mass Events. Proposing a Framework for Mitigating Risks of Crowd Disasters at Mass Events in the Public Urban Space'. Delft, Netherlands. Delft University of Technology.
28. World Health Organization(2015). 'Public Health for Mass Gatherings. Key Considerations'. Geneva, Switzerland.
29. Zhou, J, Pei, H, Wu, H. (2018). 'Early Warning of Human Crowds Based on Query Data from Baidu Maps. Analysis Based on Shanghai Stampede. Big Data Support of Urban Planning and Management'. Berlin, Germany. Springer; 19-41.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Tactical Urbanism and Design***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the concept and evolution of tactical urbanism within the broader context of urban planning and design.
- to analyse successful tactical urbanism projects and identify key factors contributing to their effectiveness.
- to develop practical skills in planning, designing, and implementing tactical urbanism interventions.
- to evaluate the impact of tactical urbanism on community engagement, policy development, and urban transformation.

Course Contents

Unit 1: Introduction to Tactical Urbanism

Definition and Origins: Examine the emergence of tactical urbanism as a response to traditional urban planning limitations; Principles and Characteristics: Understand the core principles, including community participation, flexibility, and scalability; Theoretical Frameworks: Explore the relationship between tactical urbanism and concepts such as placemaking, DIY urbanism, and urban acupuncture.

Unit 2: Case Studies and Applications

Global Perspectives: Analyse notable tactical urbanism projects worldwide, focusing on their objectives, processes, and outcomes; Local Contexts: Investigate tactical interventions in Indian cities, assessing cultural, social, and regulatory influences; Thematic Interventions: Explore applications across themes like pedestrianization, public art, temporary installations, and traffic calming measures.

Unit 3: Planning, Design and Implementation

Project Development: learn methodologies for site selection, stakeholder engagement, and resource mobilization; Design Strategies: develop design solutions that are context-sensitive, cost-effective, and sustainable; Implementation: understand the logistics of implementing tactical urbanism projects, including permitting, material selection, and on-ground coordination.

Unit 4: Evaluation and Impact Assessment

Monitoring and Evaluation: Establish criteria for assessing the success and shortcomings of interventions; Community Feedback: Engage with local communities to gather insights and measure satisfaction; Policy Implications: Discuss how tactical urbanism can influence urban policy, planning practices, and long-term urban development.

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

- to understand tactical urbanism principles, grasp the concepts of short-term, low-cost, and scalable urban interventions aimed at fostering long-term change.
- to analyse and implement projects, critically assess global tactical urbanism initiatives and design context-sensitive interventions that enhance public spaces and community engagement.
- to evaluate impact and sustainability, measure the social, economic, and environmental effects of tactical urbanism projects to inform sustainable urban development strategies.

References:

1. Lydon, M., & Garcia A. (2015). Tactical Urbanism: Short-Term Action for Long-Term Change. Island Press, Washington.
2. Ministry of Housing and Urban Affairs (2020). A Tactical Urbanism Guidebook by the Transformative Urban Mobility Initiative. GIZ, New Delhi.

3. Directorate of Urban Land Transport (2022). Guidebook for Tactical Urbanism. Urban Development Department, Karnataka.
4. Stevens Q., Kim Dovey (2023). Temporary and Tactical Urbanism (Re)Assembling Urban Space. Routledge, London.
5. Kerzner H. (2022). Project Management: A Systems Approach to Planning, Scheduling, and Controlling. Wiley and Sons, New Jersey.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Climate Change and Sustainable Development***
No. of Credits	*2 (L:2; T:0; U:0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the cross linkages between development and Sustainable Development Goals (SDG), particularly those related to climate action, poverty, hunger, water, and ecosystems. These are directly impacted by climate change and require integrated approaches for effective implementation.
- to understand how climate change could impede SDGs: Climate change, with its impacts like rising temperatures, extreme weather events, and sea-level rise, can undermine progress towards sustainable development goals.
- to understand loss and damage, and adaptation and mitigation.

Course Contents

Unit 1: Climate Change and Policies

Understanding what is climate change and its science, carbon emissions, biggest emitters, what are likely impacts based on various climatic scenarios, understanding climate politics, understanding carbon budget, carbon markets, concepts of low-carbon economy and how this could be delivered; Overview of climate policies including India's Nationally Determined Contributions, Long-Term Low-Emission Development Strategy 2022, state climate action plans, city climate action plans and others relevant.

Unit 2: Sustainable Development Goals

What are Sustainable Development Goals (SDG) and their achievement status for India, understanding the connection between climate change, environment and sustainable development; understanding climate change and sustainability in international agenda: History of Environmental Diplomacy involving UN Conference on Human Environment 1972, Earth Summit, The United Nation Framework Convention on Climate Change, among others; Environment/climate change in national agenda: Legal and policy measures in India for protecting the environment.

Unit 3: Policies and Protocols

Understanding Green House Gas (GHG) inventories and GHG protocol; Understanding Climate Change in India: urban heat island effect, urban flooding, landslides, droughts, and depletion of ground water, forests and glaciers, sea level rise, agriculture and food security, energy security, water security, Health and Conflicts; latest climate talks and negotiations: International Solar Alliance; Big Cat Alliance; Infrastructure for Resilient Island States (IRIS); International Panel on Climate Change: India's Panchamrit (net-zero) goals; Lifestyle for Environment for all; Green Development Act, CDRI, Lead IT, G20 and other related

Unit 4: Disaster and Vulnerability

Early warning systems, disaster preparedness, and response mechanisms to reduce the impact of climate-related disasters; Understanding vulnerability and risk assessment, case studies of infrastructure development that can withstand extreme weather events and how to adapt to changing climate conditions in various landscapes of hills, terrestrial and coastal regions (includes examples of hydroelectric projects, ports, heat and flood resilient developments, Sundarbans and other related)

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

- to gain knowledge and skills to achieve sustainable development in a world grappling with climate change through a holistic and integrated approach that addresses both the causes and impacts of climate change.

References:

1. Lackner M., Baharak Sajjadi and Wei-Yin Chen (2020). Handbook of Climate Change Mitigation and Adaptation. Springer Nature, Berlin.
2. Mahapatra R., S.S. Jeevan, Snigdha Das (2017). Environment Reader for Universities. Centre for Science and Environment, New Delhi.
3. Narain S. (2018). Climate Change Reader for Universities. Centre for Science and Environment, New Delhi.
4. Ministry of Environment and Forests. (2024). Engaging with the Green Climate Fund: A digital toolkit for India, Ministry of Environment and Forests, Government of India.
5. Ayyub Bilal M. (2023). Climate-Resilient Infrastructure: Adaptive Design and Risk Management. ASCE Press, Virginia.
6. Infield Elisabeth M. Hamin, Yaser Abunnasr and Robert L. Ryan (2020). Planning for Climate Change. Routledge, London.
7. Ministry of Environment, Forest and Climate Change (2021). National Action Plan on Climate Change. Government of India.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Master Plan/ Development Plan***
No. of Credits	8 (L: 0; T: 0; P: 16)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to identify the problems and potentials of a town/ city/ metropolis.by conducting different surveys and studies.
- to train students to prepare a master development plan of a town/ city/ metropolis.

Course Contents

The students shall be required to undertake the study of an urban area for purposes of preparing its Master Plan/ Comprehensive Development plan of an urban settlement. The programme may carry a predetermined focus as decided by the institution. This exercise therefore offers an opportunity to the students for learning the processes involved in the collection and analysis of data at the town level comprehensively. The study thus involves the collection and analysis of data regarding different aspect related with the establishment, nature & status and functioning of the town including historical evolution, regional setting, landuse, physical setting, socio-economic infrastructure, energy & environment, climate, housing, tourism, urban design, heritage, legal, administrative & financial aspects.

The students will identify the problems, potentials, and constraints of the urban settlement under study by applying appropriate planning standards and guidelines, and project the population, housing, transport, and other infrastructural requirements. Based on the same the students will create prepare a Master Plan/ Comprehensive Development Plan for future with different scenarios. The students will also identify the 'action areas' (i.e., specific problems related with housing, services, circulation, etc.), and propose zoning and phasing; and implementation strategy covering organizational and financial aspects.

The study so conducted shall be submitted in the form of a detailed report illustrated with suitable maps, charts, sketches, photographs. underlining the major issues related with the planned growth and development of the urban settlement.

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

- to demonstrate how to conduct surveys for different aspects and apply relevant analysis techniques to identify the problems, potentials, and constraints.
- to understand the components of the urban settlement taken for study
- to analyse the existing policy and planning literature on urban development plans, and to examine field survey data and information.
- to plan and design 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.

References:

1. Bureau of Indian Standards (2005). National Building Code of India. Bureau of Indian Standards, New Delhi
2. Ministry of Urban Development (1996). The Urban Development Plan Formulation and Implementation (UDPFI) Guidelines. Government of India, New Delhi.
3. Ministry of Urban Development (2015). The Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines. Government of India, New Delhi.
4. Kumar T.M. Vinod (2022). Smart Master Planning for Cities. Springer Nature, Berlin.

Sixth Semester						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Planning Legislation	Major	2	1	0	3
	Rural Habitat Planning	Major	2	1	0	3
	Governance and Plan Implementation	Minor	2	0	0	2
	Urban and Regional Infrastructure Planning (to include digital service delivery)	Minor	2	0	0	2
	Planning for Informal Sector	Minor	2	0	0	2
	Planning Studio - Regional Plan	Major	0	2	12	8
	Summer Internship (to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student. Its credits will be added over and above the total credits of the seventh semester)	SE	0	0	8	4
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Legislation***
No. of Credits	**3 (L: 2; T: 1; U: 0)**
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand and appreciate the structure, and concepts prevailing in the Indian Legal System and its role, relevance and application in the planning
- to understand development and management of urban and rural settlements and issues related to land acquisition and regulations of the built environment.

Course Contents

Unit 1: Concept of Law

Origin, Sources, Need of Law; Overview of the evolution and growth of Urban Legislation in India; Role and Importance of Law in Urban Planning, Development and Management; Competency to Make, Enforce and Interpret Laws; Principles and approach used in making Laws; Meaning & applicability of the terms: Articles, Sections, Rules, Bye-Laws Regulations; Preamble, Applicability of law, Proviso, Exceptions, Over-riding effect, Competent Authority, Prescribed Authority, Appellate Authority; Indian Constitutions: Overview of provisions related to Urban Planning; Overview of the operation of Judicial System: National States, District, Local Levels.

Unit 2: Sourcing and Utilising Land

Concepts of Eminent Domain, Public Purpose, Police Power; Overview of Laws related to land Assembly and Land Acquisition; Salient features of 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013; Land-Sub Division: Principles, Approach, Regulations and Provisions in Urban Laws; Change of Land Use- Meaning, Application, Process, Factors considered for permitting change of land use; Study of good examples of legal framework for sourcing land for urban development.

Unit 3: Development Controls

Introduction, Origin and Meaning of Development Controls; Role and Importance of Development Controls; Components of Development Controls; Typologies, Contents and Impact of Development Controls: Zoning, Density, Architectural Controls, Setbacks, Height, Coverage, Advertisement etc.; Study of Development Controls made applicable in any City; Building Bye-laws: Origin, Role, Importance, Components, Impact and limitations; Overview of the contents of Building Bye-laws of any City/Corporation

Unit 4: Planning Legislation

Introduction, Origin, Meaning, Need, Importance of Comprehensive Planning Legislation; Salient Features of Model Town Planning Act; Plan Preparations, Approvals & Implementation: Regional Plans/ Master Plans/ Development Plans/Zonal Plans/Local Area Plans; Overview of existing Regional, Urban Planning& Development Authorities: Structure and Functions; Overview of provisions made in planning laws related to community participation in plan preparation and plan implementation; Overview of Planning Implications of 73rd & 74th Constitutional Amendment Acts,1992.

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

- to understand genesis, structure, making and interpretation of law
- to understand typologies of plans used in promoting planned development
- to understand procedures involved in preparation, approvals and implementation of plans
- to understand options for sourcing land and controls used for ensuring planned development
- to understand agencies involved in urban planning, development and management
- to understand Role of Indian Legal System in urban planning and Development.

References:

1. Ministry of Housing and Urban Affairs (2014). Urban and Regional Development Plans Formulation and Implementation Guidelines. Government of India, New Delhi.
2. Ministry of Law and Justice (2015). The Constitution of India, New Delhi.
3. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (2013). The Gazette of India, New Delhi.
4. Kulshrestha S. K. (2012). Urban and Regional Planning in India: A Handbook for Professional Practice. Saga Publications, New Delhi.
5. Gupta J.K. and Patel NK (2021). Sourcing Land for Urban Development-Issues and Options. Gajjar offset, Ahmedabad
6. Ministry of Housing and Urban Affairs (2024). The Constitution (74th Amendment Act, 1992). Government of India, New Delhi.
7. Ministry of Panchayati Raj (2024). The Constitution (73rd Amendment Act, 1992). Government of India, New Delhi.
8. Davidson Nestor M., Geeta Tewari (2020). Law and the New Urban Agenda. Taylor & Francis, London.

Course code	As per institutional policy
Nature of course	**Major**
Course Title	**Rural Habitat Planning**
No. of Credits	3 (L: 2; T: 1; U: 0)
Internal Assessment	As per Institutional Policy
End Semester Assessment	As per Institutional Policy

Course Objectives: The student will be enabled

- to understand the typology of rural settlements and the future ways of planning these settlements.
- to get knowledge on integrating village plans to district level plans and to integrate all hierarchy of settlement plans.
- to understand the funding process of these various levels.
- to understand tribal, hilly and mining area settlements and the ways of planning them.

Course Contents

Unit 1: Rural Settlement Analysis

Rural Settlement Analysis: Types, activity, environment and economic interface in rural habitat, technology in rural settlement; Rural Land use classification and its interpretation in rural areas, transforming areas, and in metro, mega regions. an integrated approach, rural norms and standards (spatial): RADFPI Guidelines and SVAMITVA norms for Village Planning.

Unit 2: Integrated District Planning

Data Management and District Level Visioning, Institutional and other support for District Planning Committee, Bridging gap through district planning, resource mapping and determination of funding sources, consolidation of urban and rural plans; Multi-Sector and multi-level integrated approach to planning (vertical and horizontal spatial integration); Rural-Urban spatial relationship; District Development Plans: Guidelines for District Planning: Content and context and methodologies, Village Development Plans.

Unit 3: Tribal and Special Areas Settlement Plans

Tribal Settlements and planning for those areas; Hill areas and settlement planning for the villages; Coastal areas and their village planning; Mining Village areas and their settlement planning: resettlement plans for mining areas; North-East Hill areas and settlement plans.

Unit 4: Funds for Village settlements

Central and State Finance commission for Gram Panchayat Plans, Gram Panchayat Development Plan (GPDP) and Spatial Gram Panchayat Plan integration to GPDP; Gram Panchayat resource mobilisation: hinterland, gram panchayats in and around mega and metro cities; Case studies of resource mobilisation in Gram Panchayats in India; North-East Hill areas and the role of District and Gram Councils and funding.

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

- to appreciate the village to District Planning and to prepare integrated district plans based on various typologies of settlements in rural areas of India.
- to know the funding process from Gram Panchayat to Country level and the ways of the preparation of GPDP, DDP and SGDP.

References:

1. Barcus H., Roy Jones, Serge Schmitz (2023). Rural Transformations: Globalization and Its Implications for Rural People, Land, and Economies. Routledge, London.
2. Shaw D. and Nick Gallent (2020). Introduction to Rural Planning: Economies, Communities and Landscapes. Routledge, London.
3. Tan Y., Surabhi Pancholi, Niusha Esmaeilpoorarabi, Rosemary Adu-McVie (2024). Innovation District Planning: Concept, Framework, Practice. Taylor & Francis Group, London.
4. Parandamulu (2022). Tribal Development: Planning, Policies and Strategies. Pearson, Bengaluru.
5. Masot A.N. & Gascon J.L. (2021). Sustainable Rural Development: Strategies, Good Practices and Opportunities. MDPI Books, Basel.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Governance and Plan Implementation***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the functioning of the government in India at varied scales.
- to theorise the governance practices in India
- to critically assess and measure governance
- to comprehend land governance
- to update and apprise the latest innovations in the field of governance

Course Contents

Unit 1: The State

The Constitution of India, structure and functioning of the three tiers of government; urban and rural local bodies- roles, and functioning; Funds functions and functionaries in the urban management; political, administrative and functional boundaries in governing.

Unit 2: Beyond the State

Theories of governance: policy network theory, decision making theories- rational choice theory, Incrementalism; bounded rationality; organisational theory, meta-governance theory, systems theory, state-society relationship theory, etc; power in governance; Marketization & Speculative and Entrepreneurial governance

Practice of governance: local governance, centre-local relations and the role of civil society; metropolitan governance and institutional collective action; global governance and global civil society; collaborations coalitions and partnerships- collaborative governance; bureaucracy; the evolving State: public management to new public management; trans-governmental networks; role of society and non-governmental organisations; the collective action problem; politics of development.

Unit 3: Measuring governance

Participatory governance: conventional and advanced digital methods, tools, techniques and measurement index; Decentralisation and its measurement index; good governance and its measurement index; Governance Assessment Framework for Metropolitan Territorial and Regional Management (GAF-MTR); District Development Governance Index (DDGI); Corruption and Decentralized Public Governance: Corruption Perceptions Index.

Unit 4: Governance and Land Development Models

Concepts of open government: crowd sourcing, social media and blockchain; Data-Driven Decision Making; Technology in governance: E governance; M governance; Smart governance; AI governance and innovation; role of social media; Spatial data governance; energy governance; environmental and climate governance; value governance; governing the commons; corporate governance; social responsibility; Green Governance: Behaviour, leadership and entrepreneurship; any new emerging concepts; Land records and administration, data & technology; Land Governance Assessment Framework (LGAF); Land conflicts, dispute resolution and management; Tenure responsive climate smart land governance; land assembly: eminent domain acquisitions and private purchase; land and property development model: land readjustment, land pooling, licensing; land as a resource: land value capture and Land-Based Financing models.

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

- to equip the knowledge and skills to critically appraise state functioning and the role of market and society at large.

References:

1. Bevir M. (2011). The handbook of governance. SAGE Publications Ltd, New Delhi.
2. Chottray V. & Stoker G. (2010). Governance Theory: A Cross: Disciplinary Approach. Palgrave Macmillan, London.
3. Basu D.D. (2011), Introduction to the Constitution of India. Educational Printed, Nagpur.
4. Pierre Jon (2009), Models of Urban Governance: The Institutional Dimension of Urban Politics: Urban Affairs Review. Sage publications, New Delhi.
5. Sivaramakrishnan, K. (2011). Revisioning Indian Cities: The Urban renewal mission. SAGE Publications, New Delhi.
6. Giest Sarah., Klievink, Bram., Ingrams, Alex., & Young Matthew. (2025). Handbook on governance and data science. Edward Elgar Publishing, Cheltanham.
7. Gascó-Hernandez, M., (2025). Research Handbook on Open Government. Edward Elgar Publishing, Cheltanham.
8. Luca Mora, Paolo Gerli, Dominik Beckers, Sara Thabit, & Francesco Tonnarelli. (2025). Smart City Code Governance Handbook for Digital Transformation Managers in the Public Sector. Elsevier, Chennai.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Infrastructure Policies***
No. of Credits	***2(L: 2; T:0; U: 0)***
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand various schemes, policies and new development both in terms of physical and social infrastructure.

Course Contents

Unit 1: Physical Infrastructure Policy

Physical Infrastructure: Definition, components, Water supply, Sewerage, Solid Waste Management, Policies on water: National Water Policy (2012), Jal Jeevan Mission (2019), Atal Bhujal Yojana (2019), Ground Water Quality: Arsenic and Fluoride; AMRUT; NRDWP; Integrated Watershed Management Program (IWMP); State Specific water supply policies like Rajasthan and Tamil Nadu; Water Governance and legal framework; International, National and Inter-state water & land conflicts etc.; PPP in infrastructure.

Unit 2: Water and Sanitation Missions of India

Performance Assessment System of Water and Sanitation (MOHUA), SLBs, Water, Sanitation and Hygiene (WASH), Faecal Sludge and Septage Management Policy (FSSM) 2017, Swachh Bharat Mission (Clean India Mission), 2014 (Urban and Rural), National Urban Sanitation Policy (2008), Solid Waste Management Rules, 2016, Swachh Bharat Mission Phase II (2020-2025), Clean India Green India (CIGI) Initiative, Sanitation and Hygiene Education in schools and higher education.

Unit 3: Gati Shakti, IT and Health Missions of India

Gati Shakti by Government of India for infrastructure growth in India, key feature, objectives, Key sectors, collaborations, IT parks in India: Bangalore, Hyderabad, social infrastructure policies in India: National Health Policy, Pradhan Mantri Awas Yojana, 2015, Ayushman Bharat, Jal Jeevan Mission 2019

Unit 4: Digital Service Delivery

Online platforms: E-governance platforms and citizen portals facilitate online access to public services, improving efficiency and transparency, Complaint redressal systems in water supply and sanitation, digital transformation in municipalities case study India and abroad best practices; Smart infrastructure: e.g., smart lighting, water management systems, public engagement; Tools and Technologies: Use of Geospatial technologies (GIS) in infrastructure, big data analytics, Artificial Intelligence (AI), Use of ICT in infrastructure

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

- to distinguish between various policies, schemes of infrastructure
- to have a clear understanding of them which can be applied in the field.

References:

1. Government of India. (2014). Swachh Bharat Mission (Gramin): Clean India Mission - Rural. Ministry of Drinking Water and Sanitation, New Delhi.
2. Government of India. (2014). Swachh Bharat Mission (Urban): Clean India Mission - Urban. Ministry of Housing and Urban Affairs, New Delhi.
3. Ministry of Housing and Urban Affairs (MOHUA). (2016). Service Level Benchmarks for Urban Services. Government of India.
4. Government of India. (2015). AMRUT Guidelines for Urban Transformation. Ministry of Housing and Urban Affairs, New Delhi.
5. Department of Industrial Policy and Promotion (2021). PM Gati Shakti: Transforming India's Infrastructure.

Ministry of Commerce and Industry, Government of India.
6. Cohen Michael A. (2024). Infrastructure Policy and Inequality. Taylor & Francis, London.
7. Bhargava G. (2021). Development of India's Urban, Rural and Regional planning in the 21st Century Policy Perspective. Gyan Publishing House, New Delhi.
8. Croome D.C. (2024). Intelligent Buildings and Infrastructure with Sustainable and Social Values. Emerald Publishing Limited, Bingley.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Planning for Informal Sector***
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understanding about issues of urban poverty and informal sector and to critically examine various policy approaches

Course Contents

Unit 1: Concepts and Definitions

Concept, characteristics and importance of informal sector in urban areas; Socio-economic perspectives of the urban processes, Roots of informal sector in the context of poverty, migration, urbanization, etc.; Infrastructural base of informal sector, Urban planning and informal sector activities; Size and composition of informal sector, Concept of Natural markets.

Unit 2: Significance

Significance of informal sector in urban planning; Key issues in understanding and tackling the problems of informal sector; Estimation of infrastructural requirements for the informal sector; Formulation of proposals; short term and long term planning measures for informal sector; General planning and design considerations for informal sector as part of urban planning.

Unit 3: Poverty Dimensions

Urban poverty: definitions, causes, impacts and dimensions; programmes for urban poverty alleviation, Informal sector in residential, commercial and industrial context; Current planning practices and approaches for informal sector: basic need approach; Community planning approach; urban basic services approach

Unit 4: Planning and Policies

Planning for informal sector: Residential, Commercial, Industrial; Principles and techniques of low cost infrastructure for informal sector; Policies and programs for informal sector in the context of urban planning; Street vendors public of India-2009, Planning and administrative tools for informal sector;

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

- to demonstrate critical understanding about the concepts of informal sector.
- to evaluate critically the success of different approaches to dealing with urban poverty.
- to show familiarity with various policies and programmes on urban poverty and various organizations dealing with urban poverty.
- to demonstrate an understanding of how planning intervenes to deal with the issues of urban poverty.

References:

1. Urban Development Plans Formulation and Implementation Guidelines, (1996) Ministry of Urban Affairs & Employment (G.O.I.), ITPI, New Delhi.
2. Harvey D. (1973). Social Justice and the City. Edward Arnold, London.
3. Chapin F.S. (1972). Urban Land Use Planning. University of Illinois Press, Chicago.
4. Keeble L. (1972). Principles and Practice of Town and Country Planning. The Estates Gazette Ltd., London.
5. Agnotti T. (2020). Metropolis 2000: Planning, Poverty and Politics. Routledge, New York.
6. Bromley R. (2021). The Urban Informal Sector: Critical Perspectives on Employment and Housing Policies. Pergamon Press, Oxford.
7. Jain A.K. (2022) .The Informal City: Inclusive Growth for Poverty Alleviation. Read worthy Publications (P) Ltd., Delhi

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio – Regional Plan***
No. of Credits	*8(L: 0; T:2; U: 12)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled to:

- to apply theoretical concepts and methods learnt to prepare a regional plan
- to appreciate the significance of rural planning and governance at the regional scale
- to develop a resource mobilisation strategy
- to understand the regulatory and legislative framework for regional planning in India

Course Contents

The students shall be required to undertake the study of an urban area for purposes of preparing its Master Plan/ Comprehensive Development plan of an urban settlement. The programme may carry a predetermined focus as decided by the institution. This exercise therefore offers an opportunity to the students for learning the processes involved in the collection and analysis of data at the town level comprehensively. The study thus involves the collection and analysis of data regarding different aspect related with the establishment, nature & status and functioning of the town including historical evolution, regional setting, landuse, physical setting, socio-economic infrastructure, energy & environment, climate, housing, tourism, urban design, heritage, legal, administrative & financial aspects.

The students will identify the problems, potentials, and constraints of the urban settlement under study by applying appropriate planning standards and guidelines, and project the population, housing, transport, and other infrastructural requirements. Based on the same the students will create prepare a Master Plan/ Comprehensive Development Plan for future with different scenarios. The students will also identify the 'action areas' (i.e., specific problems related with housing, services, circulation, etc.), and propose zoning and phasing; and implementation strategy covering organizational and financial aspects.

The study so conducted shall be submitted in the form of a detailed report illustrated with suitable maps, charts, sketches, photographs. underlining the major issues related with the planned growth and development of the urban settlement.

Course Outcomes: Upon the completion of this course, the students will be able to prepare a regional plan. They shall be skilled to apply global contemporary regional planning practices to Indian scenarios.

Note: <u>The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.</u>

References:

1. Aalborg D. M. (2011). The city regions Project: Synthesis report: Paths to growth in medium sized European cities. Routledge, London.
2. European Commission (2016). Smart Regions Conference: Driving Smart Specialisation Investments in Priority Areas for European Growth. Council of the European Union, Brussels.
3. Markkula M. and H. Kune. (2015). Making Smart Regions Smarter: Smart Specialization and the Role of Universities in Regional Innovation Ecosystems. Council of the European Union, Brussels.
4. Avin U. and P. Patnode (2016). Sketch Tools for Regional Sustainability Scenario Planning. American Association of State Highway and Transportation Officials (AASHTO), Washington D.C.
5. Chakraborty A. & McMillan A. (2015). Scenario Planning for Urban Planners: Toward a Practitioner's Guide. Taylor & Francis, London.
6. Chakraborty A., & Sherman S. A. (2020). How Scenario Planning Affects Regional and Local Plans and Planning Practices: An Empirical Analysis Working Paper. Lincoln Institute of Land Policy, Massachusetts.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Development SD***
Course Title	***INTERNSHIP (8 WEEKS)*** *(to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student. Its credits will be added over and above the total credits of the seventh semester)*
No. of Credits	*4 (L:-0; T:-0; U:-8)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to get exposed the current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/Development Authority/Academics/NGOs.

Course Contents

Knowledge on current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/ Development Authority/Academics/NGOs.

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

- to get the current knowledge in the field of urban/metro region planning, projects, etc.

Seventh Semester						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Research Methods	Major	2	1	0	3
	Project Formulation, Appraisal and Management	Major	2	1	0	3
	Environment Planning	Minor	2	0	0	2
	Development Finance	Minor	2	0	0	2
	Dissertation Preliminaries	Minor	0	2	0	2
	Planning Studio – Detailed Project Report/ Feasibility Study	Major	0	2	12	8
	Summer Internship (to be undertaken during the summer vocations for 8 weeks)	SE	0	0	8	4
	Total Credits					**24**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Research Methods***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objective: The student will be enabled

- to equip students with the research knowledge, methodology, methods and skills
- to design, conduct, evaluate and communicate research in the identified topics of urban and regional planning, culminating into their thesis projects.

Course Contents

Unit 1: Potential Research Areas and Research Proposal

Potential topics for research: Introducing to various potential/ emerging areas for research in urban and regional planning.; Research proposal format: Background literature with conceptual and contextual rationale/ base, problem identification/ formulation, need and significance, research objectives/ research questions/ hypothesis as applicable, defining scope and limitations, methodology, identified research methods, expected outcomes, references.

Unit 2: Literature Review, Analysis and Synthesis

Systematic and critical literature review: database for the literature review, searching criteria (keywords based, abstract based); Review of relevant literature: clarifying research vocabulary/ terminologies used, identification of key parameters, research approaches, research methods (data collection and analysis), empirical literature, best practices, analysis and synthesis of relevant outcomes.

Unit 3: Research Design, Data Collection and Analysis

Research design: types of research (qualitative, quantitative, mixed methods), paradigms and traditions in planning research, sequence of research working, research design and methodology, deciding sampling techniques and data collection methods, ethics in research.; Survey formats and Data collection: preparation of survey formats such as questionnaires, sample household survey, stakeholder survey, transportation survey, data collection through focussed group discussion, interviews, observation, audio-visual documentation, etc., ; Data coding and analysis : data tabulation, data coding and de-coding, descriptive statistics (mean, median, mode, standard deviation), inferential statistics (hypothesis testing, confidence intervals), data visualization techniques (charts, graphs, maps), introduction to data analysis techniques, data interpretation and pattern identification.

Unit 4: Research Writing and Presentation

Standard formats: structuring research proposal/ research paper and thesis report writing, writing aids for systematic reporting, referencing style, etc.; Techniques for effective academic writing and revision: clear and concise research report, organizing and structuring a research report, standard writing style and vocabulary, etc. Using tables, figures, and appendices effectively, editing and proof reading to avoid common errors; Presentation skills: sheet presentation (offline and online) with good quality maps, clear and legible text, photographs, graphics, tables, flow charts, references, etc.

Course Outcome: Upon completion of this course, the students will be able

- to design research with a wholesome understanding of data collection methods, analysis tools, systematic literature review, write research proposal to be taken up in the final semester.

References:

1. Gaur D. S. (2017). Effective academic writing: A guide for researchers. New Age International, New Delhi.
2. Kumar R. (2018). Research methodology: A step-by-step guide for beginners. Sage Publications, London.
3. Sharma S. (2017). Data analysis and interpretation: A practical approach. New Age International, New Delhi.

4. Kothari C.R. and Gaurav Garg (2023). Research Methodology: Methods and Techniques. New Age International Publishers, New Delhi.
5. Aguinis Herman (2024). Research Methodology: Best Practices for Rigorous, Credible, and Impactful Research. SAGE Publications, London.
6. Flick Uwe (2020). Introducing Research Methodology: Thinking Your Way through Your Research Project. SAGE Publications, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	**Project Formulation, Appraisal and Monitoring**
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand spatial data infrastructure through advanced GIS platform
- to simulate planning preparation, manage/monitor and assess evaluation within a short time.

Course Contents

Unit 1: Introduction to Project Appraisal, Project Cycle and Stages of Appraisal

Relevance of Projects in urban and regional planning, Sources of project Identification, project cycle, Urban Planning and project appraisal. Basic fundamentals of: Depreciation, working capital, Salvage value and others; Stages of Appraisals: - Financial (those measurements based not on Time Value of Money and those which are based on Time value of Money), Economic (stages of shadow pricing, income distribution, savings, Distributional and Poverty Impacts), Social, Institutional and Environmental appraisals. Sensitivity Analysis of each of these appraisals.

Unit 2: Detailed Project Report (DPR)

Definition of DPR, content in DPR – step by step process, Project Background, Feasibility study approach – (Pre-implementation stage, implementation stage, and post-implementation stage, types of surveys to be carried out for DPR, team mobilization for DPR making.; Financial section of DPR - Fundamentals of audit, costing, and budgeting of urban planning related projects. Processes involved in financial planning, including the preparation and analysis of budgets, cost estimation, and financial audits. The role of stakeholder contributions in project financing and management, and strategies for managing emergency risk funds.

Unit 3: DPR for Projects

A case study of a neighbourhood to prepare a step-by-step detailed project report for electricity, water supply and conservation including water treatment plant, rainwater harvesting, Sanitation. Solid Waste Management and policy frameworks using GIS; A case study on an existing planned industrial township or a large-scaler regional projects, infrastructure project, single sector vs mixed industries, Industrial corridor projects, the role of NITI Aayog, role of GIS in projects.

Unit 4: Monitoring and Evaluation

Project Monitoring and Evaluation: Network analysis (CPM, PERT); Software for Project Appraisal and Monitoring and Evaluation; Types of Evaluation: Concurrent and Post Impact Evaluation.

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

- to interface the GIS skills to spatial planning to simulate, prepare, manage/monitor and evaluate spatial planning through the digital network system.

References:

1. Chandra P. (1995). Projects: Planning, Analysis, Selection, Implementation And Review. Tata Mc Graw Hill Publications, New Delhi.
2. Kerzner Harold R. (2013). Project Management: A Systems Approach to Planning, Scheduling, and Controlling. John Wiley & Sons, New York.
3. Asian Development Bank (2024). Project Performance Evaluation Report for Secondary Cities Development Project. Manila.
4. Bansal Vijay (2023). Project Management: Planning and Scheduling Techniques. Taylor & Francis, New York.
5. Garg Ajay (2024). Preparation of Detailed Project Report (DPR) and Techno-Commercial Feasibility Report (TCFR). Springer Nature, Berlin.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Environment Planning***
No. of Credits	*2 (L:2; T:0; U:0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the concept of environment and environment goods and services which encompass the natural resources and their quality that cities rely on such as air, water, green spaces, biodiversity, etc.
- to familiarise with laws and legislature related to environmental protection.
- to learn and apply scientific methods to deliver resource prudent developments, which address emerging environmental challenges like heat, floods, biodiversity loss, energy conservation, etc.

Course Contents

Unit 1: Environment and Law

Concepts of habitat and sustainability; environment and related goods and services; understanding of environmental resources; history of environment-based planning in India and the world: case studies particularly on water conservation, biodiversity protection, designing with nature, nature based systems and others suitable; Basics of environmental law with focus on key deliveries of air, water, land, environmental functions; Environmental Impact Assessment (EIA) in detail including consent to establish and operate; examples of EIA from linear and area based projects and others suitable.

Unit 2: Programmes and Policies

Understand environmental interface in the Model Building Byelaws 2016 involving sustainable design; Concepts of rain water harvesting, solid waste management, nature based solutions, zero discharge standards, low impact materials, climatology, efficient layouts, renewable energy, and others suitable; Understand the current policy landscape for environment involving India's Nationally Determined Contributions, Long-Term Low-Emission Development Strategy 2022, India Cooling Action Pan 2019, Energy Conservation Sustainable Building Code 2024, Eco Niwas Samhita 2020, Thermal Comfort Standards and Thermal Comfort Action Plan 2050.

Unit 3: Environmental Economics and Data Management

Concept of environmental economics; Basics of environmental engineering; Understanding environmental risks and mitigation strategies; Environmental costing; Handling environmental data.

Unit 4: Environmental Tools

Understanding different environmental landscapes (especially hills, terrestrial, coastal etc); Analysing/calculating pressures on these landscapes and their carrying capacity for development projects with due consideration to ecosystem, its services & conservation including environmental engineering; Understanding of land surface temperatures; Mapping green and blue infrastructure using remote sensing & geographical information system and other suitable tools.

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

- to plan and design resource prudent development which has abilities to safeguard environment
- to fulfil the economic needs of any developing economy.

References:

1. Narain S. (2018). Climate Change Reader for Universities. Centre for Science and Environment, New Delhi.
2. Roychowdhury A., Rajneesh Sareen, Mitashi Singh and Nimish Gupta (2025). Planning and Designing Habitat in Climate-Risked Times: Heat Toolkit. Centre for Science and Environment, New Delhi.
3. The World Economic Forum (2023). Seizing the momentum to build resilience for a future of sustainable inclusive growth. The World Economic Forum with McKinsey and Company, Switzerland.

4. McLean, William and Pete Silver (2021). Environmental Design Sourcebook: Innovative Ideas for a Sustainable Built Environment. RIBA Publishing, London.
5. Gemitzi A., Nikolaos Koutsias, Venkat Lakshmi (2020). Advanced Environmental Monitoring with Remote Sensing. Routledge, London.
6. Muthukrishnan S. (2024). Introduction to Environmental Economics. Prentice Hall, New Jersey.
7. Board Central Pollution Control (2021). Pollution Control Acts, Rules and Notifications. Central Pollution Control Board, Ministry of Environment and Forest, Government of India.
8. Barthwal R.R. (2020). Environmental Impact Assessment. New Age International Publishers, Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	**Development Finance**
No. of Credits	*2(L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the financing mechanisms of finances for urban and regional development including the Centre-State-Local Self Governance fiscal arrangements through Constitution (SFC, CFC, tied and untied grants), through multi-lateral, bi-lateral funding, guarantees, debt equity, taxes and service charges.

Course Contents

Unit 1: Overview of Development Finance

Development Finance- approaches, concepts, components, process, credits rating; Role of Improvement Trusts, Development Authorities, SEZs and Special Purpose Vehicles (SPV) in Equity Finance, Taxes, Fees, Development Charges, Urban Finance Management.

Unit 2: State and Municipal Finance

Central Finance Commission (CFC) and State Finance Commission (SFC)- Constitution, Powers and Functions; Consolidated Fund (Central and State); Centrally Sponsored Schemes; Municipal Finance- Categorisation of Municipal Sources of Revenue, Internal Vs. External Revenue, Capital Vs. Revenue Receipt; Municipal Finance Assessment Framework; Reforms in Municipal Finance- Unit Area Method in Property Tax Calculation, Rationalisation of User Charges; Streamlining Municipal Tax Administration

Unit 3: Public Private Partnership (PPP)

Concept, need, preconditions for Partnerships; Advantages of Collaboration, Methods of Promoting Participation, Regulations and Administrative Procedures; Role of Government as Partner, Regulator and Enforcer; Principles of PPP- Contractual Framework, Selection of Service Provider, Payment Mechanism, Monitoring and Evaluation, Risk and Revenue Sharing; Regulatory Authority for PPP; Model Contract Agreement.

Unit 4: Innovative Methods of Financing Urban Development

Monetary Extraction- Betterment Levy, Impact Fee, External Development Charges and Vacant Land Development Tax; Land Exactions- TDR, Town Planning Scheme, Monetisation of Underutilised Public Assets; Valorisation Charges; External Finance- Debt Financing, PPP, Financial Intermediaries, Municipal Bond, Pooled Finance.

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

- to appreciate the development finance, its various forms and sources, and techniques to raise funds.
- to appreciate the constitutional provisions of fiscal transfers from centre to state and local self-government, formulas associated with it and its effectiveness.

References:

1. Ryan Roberta and Ronald Woods (2015). Decentralisation and Subsidiarity: Concepts and frameworks for emerging economies. Forum of Federations. Ottawa, Ontario.
2. Participatory Research in Asia (PRIA) (2018). State Finance Commission Recommendations. PRIA, New Delhi.
3. Isabelle Joumard, Hermes Morgavi and Hugo Bourrousse (2017). Achieving strong and balanced regional development in India. Economics Department, Paris.
4. Statistical Office National (2020). Final Report of the Committee for Sub-National Accounts. Ministry of Statistics and Programme Implementation, Government of India.
5. NITI AAYOG (2023): National Multidimensional Poverty Index: A progress Review 2023. NITI AAYOG, Government of India, New Delhi.
6. Central Finance Commission (2021). XV Central Finance Commission. Government of India, New Delhi.
7. Abor Joshua Yindenaba, Charles Komla Delali Adjasi, Robert Lensink (2021). Contemporary Issues in Development Finance. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	*Minor*
Course Title	***Dissertation Preliminaries***
No. of Credits	*2 (L: 0; T:2; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand current issues & research areas in the relevant field of urban planning

Course Contents

Students undertake independent study/research to explore and develop an area of his/her own choice. It should cover identification of dissertation topic after scanning later literature and identifying gaps, typology of research, Methods of research, time scheduling, preparation of samples, questionnaires/interview schedules, identifying stakeholders/sample, area/case study, and preparation of organizing the interview /notes, report, and abstract for canvassing during interviews.

The theme of the dissertation should adopt a fresh approach in formulating a concept of developing an effective and useful methodology. Each student shall prepare a dissertation abstract on a selected topic under the supervision of a supervisor.

At the end of the dissertation preliminaries, the students are required to submit a hard copy of the abstract

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

- to appreciate the process & importance of literature survey in identifying research areas to finalize the methodology of research and preparation of work schedule.
- to finalize the sample size, questionnaires, and models for analysis.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio –*** ***Detailed Project Report Feasibility Study***
No. of Credits	*8 (L: 0; T:2; U: 12)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop proficiency in preparing a detailed project report (DPR) for urban and regional planning projects.
- to conduct feasibility assessments, including technical, economic, social, and environmental factors.
- to integrate data collection, spatial analysis, and policy review in project formulation.
- to enhance technical writing, graphic communication, and presentation skills in planning reports.
- to familiarize students with government policies, funding mechanisms, and legal frameworks for project execution.

Course Contents

Unit 1: Introduction to Detailed Project Report & Feasibility Study

Concept and Purpose of a DPR in urban and infrastructure projects; Types of Feasibility Studies: technical, economic, social, legal, and environmental; Structure and Components of a DPR (problem statement, objectives, methodology, project scope, and expected outcomes); Case Studies of urban and regional planning DPRs (transportation, housing, industrial, tourism, smart cities, etc.).

Unit 2: Data Collection, Site Analysis & Stakeholder Consultation

Primary and Secondary Data Collection Methods: field surveys, GIS mapping, stakeholder interviews; Site Analysis: location mapping, land use, environmental constraints, infrastructure availability, accessibility; Socio-Economic Analysis: demographics, employment, economic viability of proposed projects; Consultation with Stakeholders – government agencies, private sector, communities, funding bodies.

Unit 3: Project Feasibility and Financial Analysis

Technical Feasibility: infrastructure planning, urban design standards, construction methodologies; Economic and Financial Viability: cost estimation, revenue models, funding sources, cost-benefit analysis; Social and Environmental Impact Assessment: sustainability, resilience, mitigation strategies; Legal and Regulatory Considerations: approvals, land acquisition, zoning regulations, government policies.

Unit 4: Report Preparation, Implementation & Presentation

Report Structuring: executive summary, introduction, methodology, findings, recommendations, and conclusion; Implementation Strategy: phasing, timeline, budgeting, institutional framework, risk assessment; Final Presentation & Review: graphical communication, mapping, report visualization, stakeholder presentation; Submission of DPR: professionally formatted document with maps, infographics, and policy recommendations.

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

- to conceptualize, analyse, and prepare a DPR for an urban/regional project, evaluate its feasibility
- to develop an implementation strategy aligned with financial, social, and environmental sustainability.

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

References:

1. Ministry of Housing and Urban Affairs (2020). Detailed Project Report Guidelines for Urban Infrastructure Projects. Government of India, New Delhi.
2. Patel, B., & Buddhadeb, M. (2018). Project Planning & Infrastructure Development in Urban Areas.
3. Taliercio Robert and Eduardo Andres Estrada (2020). Best Practices in Project Appraisal and Selection: How Strong Infrastructure Governance Can End Waste in Public Investment. IMF, Washington DC.
4. Asian Development Bank (2024). Project Performance Evaluation Report for Secondary Cities Development Project. Manila.
5. Bansal Vijay (2023). Project Management: Planning and Scheduling Techniques. Taylor & Francis, New York.
6. Garg Ajay (2024). Preparation of Detailed Project Report (DPR) and Techno-Commercial Feasibility Report (TCFR). Springer Nature, Berlin.

Course Code	*As per Institutional Policy*
Nature of Course	***Skill Development SD***
Course Title	***INTERNSHIP (8 WEEKS)*** *(to be undertaken during the summer vocations for 8 weeks after the sixth semester by the student. Its credits will be added over and above the total credits of the seventh semester)*
No. of Credits	*4 (L: -0; T: -0; U: -8)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to get exposed the current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/ Development Authority/Academics/NGOs.

Course Contents

Knowledge on current policies, programmes, and projects in the field of Urban/Metro region in Town Planning Department/ Development Authority/Academics/NGOs.

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

- to get the current knowledge in the field of urban/metro region planning, projects, etc.

Eighth Semester **Option I: (for the candidates opting exit after four years)**						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Professional Practice and Ethics	Major	2	1	0	3
	Public Policy and Planning	Major	2	1	0	3
	Heritage Conservation and Urban Renewal	Minor	2	0	0	2
	Planning Studio – Planning Dissertation	Major	0	5	14	12
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Professional Practice and Ethics***
No. of Credits	3 (L: 2; T:1; U: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the importance, role, responsibility and duties, as a planning professional, in making human living and human settlements more qualitative, productive, safe and sustainable
- to understand the principles and ethics, to be followed and respected, during the professional practice and running a professional consultancy.

Course Contents

Unit 1: Profession & Professional Institutes

Role, relevance, importance of planning profession in human living and climate change; Role, responsibilities & duties of planners in promoting planned development & achieving SDGs; Planning- Profession or a Business; Professional Competency**;** Conflict resolution and decision making in planning projects; Relation with co-professionals & professional institutes: architecture, engineering, landscaping, environment etc.; Study of origin, objectives, membership, activities, role, importance of Institute of Town planners, India, in making planning profession & planning education, more qualitative and productive

Unit 2: Code of Professional Conduct & Ethics

Professional Ethics; Origin, need, importance, role in profession& practice; Code of Professional Conduct- Objective, basic ethics, professional ethics, as defined by Institute of Town Planners, India; Professional responsibilities: towards fellow professionals. Communities and stakeholders; Professional misconduct & dispute resolution; Copyright in planning projects & planning practice

Unit 3: **Professional Services**

Concept, origin, meaning, scope & approach -in providing Professional services; Typologies, scope, time-lines, stages and deliverables in the professional services; Scale of Professional fee & charges; meaning, methods of calculating fee, stages of payments for- projects and as consultant & retainer; Role, duties and responsibilities while rendering professional services; Planning Competitions; organising, conducting, evaluating and awarding.

Unit 4: Professional Engagement and Office Administration

Consultancy: nature, composition, registration of firms; roles, responsibilities, liabilities of the partners; Office management: engaging& managing manpower, office correspondence; maintaining records & accounts; discharging Tax liabilities; Preparing, floating, examining and finalizing Tenders, awarding of projects; Meaning, role, importance and competency for entering into and execution of Contracts,; Engaging and involving professionals, consultants & advisors; Role, importance and process followed in conflict resolution in projects, using Arbitration.

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

- to develop understanding about his role, relevance and importance as a professional in;
- to promoting human living and human habitat, making it more qualitative;
- to understanding the role and context of ethics in profession and professional practice;
- to leveraging his knowledge and skill in promoting public good;
- to provide professional services in an efficient & transparent manner.

References

1. Barrett, C.D. (2001) Everyday Ethics for Practicing Planners, American Institute of Certified Planners, Chicago.
2. Forester J. (1999) The Deliberative Practitioner: Encouraging Participatory Planning Processes. MIT Press, Massachusetts.
3. Kulshreshtha S.K. (2012) Urban and Regional Planning in India: A Handbook for Professional Practice. Sage, New Delhi.
4. Schön D. (1983) The Reflective Practitioner: How professionals think in action. Temple Smith, London.
5. Thomas H. and Healey P. (1991). Dilemmas of Planning Practice: Ethics, legitimacy, and the validation of knowledge. Avebury, Surrey.
6. Weitz J. (2020). The Ethical Planning Practitioner. Routledge, London.
7. Saccoccia S. (2021) Planning Practice. MIT Press, Massachusetts.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Public Policy and Planning***
No. of Credits	*3 (L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand process of policy making
- to understand approaches and models for policy analysis
- to understand public policy initiatives in the urban domain

Course Contents

Unit 1: Fundamentals of Public Policy: Process, Implementation and Evaluation

Lasswell's public policy cycle, the stages model- The heuristic model of public policymaking- agenda setting, policy formulation, legitimation, implementation, evaluation and policy maintenance; Introduction to approaches to study of public policy – power and Governmentality, Group, rational choice, incremental, interpretive; Policy Actors and Networks- State and Extra-government; policy networks and communities; Street Level Bureaucracy; interest groups and pressure groups;

Unit 2: Public Policy Making in India

Public Policy: Concept, Nature and Scope; Evolution of public policy in India; Top-down, bottom-up and collaborative Models, Major Types of Public Policy; Constitutional Provisions and Existing Policies in the urban domain; role of cabinet and executive, legislature and judiciary; Social Movements and Public Policy in India; institutional factors in policy implementation;

Unit 3: Urban Policies in India: Critical Appraisal

Statutory spatial plans as spatial policies; various publications of the Niti Aayog, NIUA, various ministries as policy documents; Urban programs and statutory plans as public policy: urban and rural guidelines; Landuse policies, urbanisation policies, state urban policies; Success and Failures; an account of emerging policy subject areas and a critique of the gaps found- gender lens, inclusion lens, power lens, capability lens etc.

Unit 4: Policy Evaluation Methods

Techniques and Approaches; Policy Evaluation: Role, Process and Criteria; Policy Performance: Evaluating Impact: ex-ante and ex-post; measuring effectiveness and impact of policies, using various approaches like formative, process, outcome, impact, and cost-benefit evaluations.

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

- to critically asses the contents of policy documents, create frameworks and data Set required for policy analysis
- to analyse urban policies and their implications on Urban Planning

References:

1. Chakrabarty, Bidyut& Prakash Chand(2016). Public Policy in India: Concepts, Theories& Practice. Sage, New Delhi.
2. Sapru R K. (2010). Public Policy: Art and Craft of Policy Analysis. PHI Learning Private Limited, New Delhi.
3. Birkland T.A. (2011). An Introduction to the Policy Process. PHI Learning, New Delhi.
4. Wollmann H. (2007). Policy Evaluation and Evaluation Research. CRC Press, Florida.
5. Raj K. (2021). Public Policy in India. Rawat Publications, New Delhi.
6. Chattopadhyay S. and Apurba Kumar Chattopadhayay (2021). Policy Making: Challenges and Concerns. Gyan Pod Publisher, New Delhi.
7. Gerven Minna van, Christine Rothmayr Allison and Klaus Schubert (2024). Encyclopedia of Public Policy. Springer Nature, Berlin.

Course code	*As per Institutional Policy*
Nature of course	***Minor***
Course Title	***Heritage, Conservation and Urban Renewal***
No. of Credits	*2 (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the importance of Indian heritage both tangible and intangible, and to conserve them, integrate them to mainstream of planning process.
- to understand for the industrial, landscape, and slums and come out with the urban renewal plans and to bring it as a part of Planned Development.

Course Content

Unit 1: Heritage Conservation Typologies

Natural heritage conservation: types, policies for conservation, regulatory measures, community participation; built heritage conservation: determinants of built form on heritage; historical urban infrastructure and traditional water harvesting system.; intangible cultural heritage and development issues; conservation strategies: old city, inner areas; Integration of historic monuments, areas, cores, urban system in the development process and land use; regulatory measures and community involvement.

Unit 2: Principles of Conservation

Basic concepts of conservation values: overview and introduction; Principles for judging the conservation importance of sites, area and related typology; scope and basic technique of urban conservation; national policies and programmes on Heritage Cities and Planning, Industrial Policy of historical townships/zones and landscape areas.

Unit 3: Management of Urban Conservation Assets

Legal and administrative aspects, archaeological acts/charters pertaining to conservation, development and conservation; Role of international and national agencies in heritage management; Policies and programmes for heritage management; Case studies on management of urban conservation of sites/area in India and abroad.

Unit 4: Urban Renewal and Regeneration

Identification of areas for urban renewal; typology of areas; urban renewal policies across India and abroad. Slums, Industrial areas, commercial areas, and historic areas and kind of planning design and implementation. Role of communities and urban renewal, community participation in urban renewal; Best practices: national and international.

Course Outcome: Upon the completion of this course, the students will be able

- to appreciate the Indian heritage both tangible and intangible and integrate them with the planning process and policies.
- to prepare urban renewable policies and plans for industrial, landscape areas and slums.

References:

1. Cameron C. (2024). Evolving Heritage Conservation Practice in the 21st Century. Springer, Singapore.
2. Teba T. and Antonino Di Raimo (2025). Conservation of Architectural and Urban Heritage. Springer Nature, Berlin.
3. Woodward Simon C. and Louise Cooke (2023). World Heritage: Concepts, Management and Conservation. Routledge, London.
4. Elander I. (2022). Urban Renewal, Governance and Sustainable Development. MDPI Books, Basel.
5. Perrault R. (2022). Urban Regeneration: Methods, Implementation and Management. Nova Science Publishers, New York.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio Planning Dissertation***
No. of Credits	*12 (L: 0-; T:-5; U: -14)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop a basic understanding of the area chosen for study (by carrying out a detailed literature review).
- to undertake detailed exploration of the topic (by way of surveys and studies).
- to identify issues and concerns those emerge out of the study and suggest recommendations.

Course Contents

Guided research by a student under the supervision of an individual/group of faculties from formulation to submission of the research.

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

- to enhance ability to critically analyse complex housing issues and data, developing a keen understanding of underlying problems and trends.
- to advance research skills, including designing studies, collecting and analysing data, and synthesizing information from multiple sources.
- to improve problem-solving abilities, with a focus on developing practical and innovative solutions to housing challenges.
- to increased attention to detail in conducting research, analysing data, and presenting findings, ensuring accuracy and thoroughness.
- to experience in managing a research project from inception to completion, including planning, executing, and reviewing progress.

Eighth Semester **Option II (for the candidates continuing for Five Year Integrated Programme)**						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Professional Practice and Ethics	Major	2	1	0	3
	Public Policy and Planning	Major	2	1	0	3
	Urban Supply Chain Management	Minor	2	1	0	2
	Heritage Conservation and Urban Renewal	Minor	2	0	0	2
	Politics, Planning and Development	Minor	2	0	0	2
	Planning Studio – Special Area Plans	Major	0	2	10	8
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Professional Practice and Ethics***
No. of Credits	3 (L: 2; T:1; U: 0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the importance, role, responsibility and duties, as a planning professional, in making human living and human settlements more qualitative, productive, safe and sustainable
- to understand the principles and ethics, to be followed and respected, during the professional practice and running a professional consultancy.

Course Contents

Unit 1: Profession & Professional Institutes

Role, relevance, importance of planning profession in human living and climate change; Role, responsibilities & duties of planners in promoting planned development & achieving SDGs; Planning- Profession or a Business; Professional Competency**;** Conflict resolution and decision making in planning projects; Relation with co-professionals & professional institutes- architecture, engineering, landscaping, environment etc.; Study of origin, objectives, membership, activities ,role , importance of Institute of Town planners, India, in making planning profession & planning education, more qualitative and productive

Unit 2: Code of Professional Conduct & Ethics

Professional Ethics; Origin, need, importance, role in profession& practice; Code of Professional Conduct- Objective, basic ethics, professional ethics, as defined by Institute of Town Planners, India; Professional responsibilities -towards fellow professionals. Communities and stakeholders; Professional misconduct & dispute resolution; Copyright in planning projects & planning practice

Unit 3; **Professional Services**

Concept, origin, meaning, scope & approach -in providing Professional services; Typologies, scope, time-lines, stages and deliverables in the professional services; Scale of Professional fee & charges; meaning, methods of calculating fee, stages of payments for- projects and as consultant & retainer; Role, duties and responsibilities while rendering professional services; Planning Competitions; organising, conducting, evaluating and awarding,

Unit 4: Professional Engagement and Office Administration

Consultancy - nature, composition, registration of firms; roles , responsibilities , liabilities of the partners; Office management – engaging& managing manpower , office correspondence; maintaining records & accounts; discharging Tax liabilities; Preparing, floating, examining and finalizing Tenders, awarding of projects; Meaning, role, importance and competency for entering into and execution of Contracts,; Engaging and involving professionals, consultants & advisors; Role, importance and process followed in conflict resolution in projects, using Arbitration

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

- to develop understanding about his role, relevance and importance as a professional;
- to promoting human living and human habitat, making it more qualitative;
- to understanding the role and context of ethics in profession and professional practice;
- to leveraging his knowledge and skill in promoting public good;
- to providing professional services in an efficient & transparent manner.

References

1. Barrett, C.D. (2001). Everyday Ethics for Practicing Planners, American Institute of Certified Planners, Chicago.
2. Kulshreshtha S.K. (2012). Urban and Regional Planning in India: A Handbook for Professional Practice. Sage, New Delhi.
3. Schön D. (1983). The Reflective Practitioner: How Professionals Think in Action. Temple Smith, London.
4. Thomas H. and Healey P. (1991). Dilemmas of Planning Practice: Ethics, Legitimacy, and the Validation of Knowledge. Avebury, Surrey.
5. Weitz J. (2020). The Ethical Planning Practitioner. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Public Policy and Planning***
No. of Credits	*3 (L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the process of policy making
- to understand the approaches and models for policy analysis
- to understand the public policy initiatives in the urban domain

Course Contents

Unit 1: Fundamentals of Public Policy: Process, Implementation and Evaluation

Lasswell's public policy cycle, the stages model: The heuristic model of public policymaking- agenda setting, policy formulation, legitimation, implementation, evaluation and policy maintenance; Introduction to approaches to study of public policy: power and Governmentality, Group, rational choice, incremental, interpretive; Policy Actors and Networks- State and Extra-government; policy networks and communities; Street Level Bureaucracy; interest groups and pressure groups;

Unit 2: Public Policy Making in India

Public Policy: Concept, Nature and Scope; Evolution of public policy in India; Top-down, bottom-up and collaborative Models, Major Types of Public Policy; Constitutional Provisions and Existing Policies in the urban domain; role of cabinet and executive, legislature and judiciary; Social Movements and Public Policy in India; institutional factors in policy implementation;

Unit 3: Urban Policies in India: Critical Appraisal

Statutory spatial plans as spatial policies; various publications of the Niti Aayog, NIUA, various ministries as policy documents; Urban programs and statutory plans as public policy: urban and rural guidelines; Landuse policies, urbanisation policies, state urban policies; Success and Failures; an account of emerging policy subject areas and a critique of the gaps found- gender lens, inclusion lens, power lens, capability lens etc.

Unit 4: Policy Evaluation Methods

Techniques and Approaches; Policy Evaluation: Role, Process and Criteria; Policy Performance: Evaluating Impact: ex-ante and ex-post; measuring effectiveness and impact of policies, using various approaches like formative, process, outcome, impact, and cost-benefit evaluations.

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

- to critically asses the contents of policy documents, create frameworks and data Set required for policy analysis to analyse urban policies and their implications on Urban Planning

References:

1. Chakrabarty, Bidyut & Prakash Chand (2016). Public Policy in India: Concepts, Theories & Practice. Sage, New Delhi.
2. Sapru R K. (2010). Public Policy: Art and Craft of Policy Analysis. PHI Learning Private Limited, New Delhi.
3. Birkland T.A. (2011). An Introduction to the Policy Process. PHI Learning, New Delhi.
4. Raj K. (2021). Public Policy in India. Rawat Publications, New Delhi.
5. Chattopadhyay S. and Apurba Kumar Chattopadhayay (2021). Policy Making: Challenges and Concerns. Gyan Pod Publisher, New Delhi.
6. Gerven Minna van, Christine Rothmayr Allison and Klaus Schubert (2024). Encyclopedia of Public Policy. Springer Nature, Berlin.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Urban Supply Chain Management***
No. of Credits	*2 (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop a comprehensive understanding of urban supply chain management (SCM) and its key components.
- to acquire knowledge of spatial decision-making techniques and strategies for sustainable SCM.

Course Contents

Unit 1: Fundamentals of Urban Supply Chain Management

Urban Logistics vs. Urban Supply Chain Management (SCM); Key Components of Urban SCM: Logistics, Transportation, Warehousing, Distribution; Supply Chain Network Design and Planning; SC Performance Measurement and Optimization; Geospatial Data and Technologies in SCM.

Unit 2: Spatial Decision-Making in Supply Chains

Decision-Making Techniques in SCM; Facility Location and Spatial Optimization; Location-Allocation Models in Urban Supply Chain Planning; Spatial Interaction Models for Warehousing and Distribution; Urban Transportation Network Design; Routing and Scheduling Optimization.

Unit 3: Sustainable and Digital Supply Chains

Sustainable Supply Chain Management; Green Supply Chain Strategies; Supply chain carbon footprint; Circular Economy in Urban Supply Chains; Climate Resilience and Disaster Preparedness in Supply Chains; Designing Emergency Supply Chains; Smart Practices in SCM: 21st Century Supply Chains; Digital and Smart Supply Chains; Blockchain & AI Integration.

Unit 4: Case Studies

Case Studies on Smart, Resilient, and Sustainable SCM; Reverse Logistics and Closed-Loop Urban Supply Chains

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

- to apply various spatial analysis techniques for optimizing supply chain networks in urban contexts.

References:

1. Frazelle E. H. (2001). Supply chain strategy. McGraw Hill Professional.
2. Simchi-Levi D., Kaminsky P. & Simchi-Levi, E. (2008). Designing and managing the supply chain: Concepts, Strategies, and Case Studies. McGraw-Hill Education, New York.
3. MacCarthy B. L., & Ivanov D. (2022). The digital supply chain. Elsevier, Chennai.
4. Anbumozhi V., Kimura F. & Thangavelu S.M. (2021). Supply chain resilience: Reducing Vulnerability to Economic Shocks, Financial Crises, and Natural Disasters. Springer, Berlin.
5. Monios J., Lucy Budd and Stephon Ison (2023). The Handbook of Urban Logistics. Taylor & Francis Group, London.
6. Grant David B. and Alexander Trautrims (2022). Sustainable Logistics and Supply Chain Management: Principles and Practices for Sustainable Operations and Management. Kogan Page, London.
7. Achillas C., Dionysis D. Bochtis, Dimitrios Aidonis, Dimitris Folinas (2020). Green Supply Chain Management. Routledge, London.

Course code	*As per Institutional Policy*
Nature of course	***Minor***
Course Title	***Heritage, Conservation and Urban Renewal***
No. of Credits	*2 (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the importance of Indian heritage -both tangible and intangible, and to conserve them, integrate them to mainstream of planning process.
- to understand for the industrial, landscape, and slums and come out with the urban renewal plans and to bring it as a part of Planned Development.

Course Content

Unit 1: Heritage Conservation Typologies

Natural heritage conservation- types, policies for conservation, regulatory measures, community participation; built heritage conservation- determinants of built form on heritage; historical urban infrastructure and traditional water harvesting system.; intangible cultural heritage and development issues; conservation strategies- old city, inner areas; Integration of historic monuments, areas, cores, urban system in the development process and land use; regulatory measures and community involvement.

Unit 2: Principles of Conservation

Basic concepts of conservation values- overview and introduction; Principles for judging the conservation importance of sites, area and related typology; scope and basic technique of urban conservation; national policies and programmes on Heritage Cities and Planning, Industrial Policy of historical townships/zones and landscape areas.

Unit 3: Management of Urban Conservation Assets

Legal and administrative aspects, archaeological acts/charters pertaining to conservation, development and conservation; Role of international and national agencies in heritage management; Policies and programmes for heritage management; Case studies on management of urban conservation of sites/area in India and abroad.

Unit 4: Urban Renewal and Regeneration

Identification of areas for urban renewal; Typology of areas; Urban renewal policies across India and abroad; Slums, Industrial areas, commercial areas, and historic areas and kind of planning design and implementation; Role of communities and urban renewal, community participation in urban renewal; Best practices: national and international.

Course Outcome: Upon the completion of this course, the students will be able

- to appreciate the Indian heritage both tangible and intangible and integrate them with the planning process and policies.
- to prepare urban renewable policies and plans for industrial, landscape areas and slums.

References:

1. Cameron C. (2024). Evolving Heritage Conservation Practice in the 21st Century, Springer, Singapore.
2. Teba T. and Antonino Di Raimo (2025). Conservation of Architectural and Urban Heritage. Springer Nature, Berlin.
3. Woodward Simon C. and Louise Cooke (2023). World Heritage: Concepts, Management and Conservation. Routledge, London.
4. Elander I. (2022). Urban Renewal, Governance and Sustainable Development. MDPI Books, Basel.
5. Perrault R. (2022). Urban Regeneration: Methods, Implementation and Management. Nova Science Publishers, New York.

Course code	*As per institutional policy*
Nature of course	***Minor***
Course Title	***Politics, Planning and Development***
No. of Credits	*2 (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The students will be enabled

- to understand about political science theory and its application in planning.
- to understand the interface between politics, planning process, and its implementation.
- to know about Indian Political system and its implication on land policies and management.

Course Contents

Unit 1: 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. Various typology of Rights: Human, Water, Land, Property, etc.

Unit 2: Politics in Planning

Political institutions at centre, state and local political economy; Emergence of state in the federal set up; Politics of the state and bureaucracy; Politics and emergence of civil society; Regeneration and redevelopment politics; Property rights, norms and standards, Regulatory state, reforming state, rent-seeking state and its spatial implications.

Unit 3: Politics of Provision

Land use politics; Politics of provision of infrastructure and housing in urban and rural areas; Political decision-making processes; Case studies from India and on planning and political decisions and their impact on rural and urban development; Politics of displacement.

Unit 4: Indian States and Spatial Planning

Planning and Development in various states: typology of planning, hierarchy of spatial planning decisions and its management; Decision making at various levels of settlements (village to District, towns, metro, mega cities); Spatial policy in states; Spatial politics in planned development; Special states and land development and politics; Progressive states and means and ways of land management through politics; Bureaucracy and Political Decisions on Spatial Planning; Case studies.

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

- to appreciate politics and planning at different levels.
- to formulate the policies adhering to political scenarios
- to appreciate the decision making process at different levels

References:

1. Roskin Michael G. and Robert L. Cord (2020). Political Science. Pearson Education, London.
2. Verghese D. (2023). Political Science: Theory and thought. MPP House, Bengaluru.
3. Agena D. (2021). Land-Use Politics Guidebook. Independent Publisher, Traverse.
4. Saxena P.P. (2024). Property Law. LexisNexis, Gurgaon.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio – Special Area Plans***
No. of Credits	*8 (L: 0; T:2; U: 10)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the special township/areas such as industrial township/investment regions/port towns, heritage towns, etc.
- to understand special areas within a city and its plan preparation.

Course Contents

Providing students with knowledge on current policies of special areas/zones, SEZ, special townships, regions, and corridors. Emphasis on inter linkages between these special areas to existing settlements will be provided. Guided by the faculty, a Plan preparation of special areas and detailed project report, and the actual knowledge of stage wise plan preparation, implementation and monitoring will be carried out in the studio exercise.

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

- to prepare a special area plan and could prepare a Detailed Project Report for a selected land use area.

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Ninth Semester						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Smart Cities	Major	2	1	0	3
	Inclusive Cities	Major	2	1	0	3
	Technology and Sustainable Cities	Minor	2	0	0	2
	Advanced Spatial Data Analytics	Minor	4	2	0	2
	Energy and Planning	Minor	4	2	0	2
	Planning Studio – Future Cities	Major	0	2	12	8
	Internship (Optional)	Audit	-	-	-	
	Total Credits					**20**

Note: ***The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.***

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Smart Cities***
No. of Credits	*3 (L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the fundamental concepts, principles, and evolution of smart cities.
- to analyse the role of technology and data-driven solutions in urban planning and governance.
- to examine global and national smart city initiatives and their impact on sustainable urban development.
- to explore strategies for integrating smart infrastructure, mobility, and environmental sustainability in city planning.

Course Contents

Unit 1: Introduction to Smart Cities

Definition, concept, and evolution of smart cities; Components and key characteristics of a smart city; Global best practices and smart city models; Smart Cities Mission (India) and international policies; Challenges in smart city development.

Unit 2: Smart Infrastructure and Technology Integration

Role of ICT, AI, IoT, and Big Data in smart cities; Intelligent transport systems and urban mobility solutions; Smart grids, renewable energy, and energy-efficient systems; Water supply, waste management, and sanitation in smart cities; GIS-based planning, automation, and real-time monitoring.

Unit 3: Sustainable Urban Development and Governance

Sustainable development goals (SDGs) and smart cities; Climate resilience and disaster management in urban areas; Citizen participation and e-governance in smart cities; Financing models: Public-private partnerships (PPP) and funding mechanisms; Smart regulations and policy frameworks

Unit 4: Planning and Designing Smart Cities

Urban design strategies for smart and sustainable cities; Affordable housing and mixed-use developments; Walkability, green spaces, and urban liveability; Retrofitting existing cities with smart solutions; Future trends and innovations in smart city development

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

- to explain the concept, principles, and evolution of smart cities.
- to apply smart technologies and data-driven solutions in urban planning.
- to evaluate the impact of smart city initiatives on sustainability and governance.
- to develop planning and design strategies for integrating smart infrastructure, mobility, and urban services.

References:

1. Kitchin R. (2014). The Data Revolution: Big Data, Open Data, Data Infrastructures & Their Consequences. Sage, New Delhi.
2. Townsend A. (2013). Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia. W.W. Norton & Company, New York.
3. Kumar A. (2024). Introduction to Smart Cities. Pearson India, New Delhi.
4. Sushil Kumar Singh, Bal Virdee, Rajendrasinh Jadeja (2024). Building Tomorrow's Smart Cities with 6G Infrastructure Technology. IGI Global, Pennsylvania.
5. Khare A. and Terry Beckman (2025). Sustainable and Smart Cities: Governance, Economy and Society. Routledge, London.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Inclusive Cities***
No. of Credits	*3 (L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the concept of inclusivity and differentiate it from other similar concepts in urban contexts.
- to know how different theoretical perspectives inform the idea of inclusive cities.
- to Identify the challenges faced by marginalized groups in urban environments.
- to develop a critical understanding of existing policies, frameworks, guidelines for inclusive cities.
- to know international and national urban planning practices for inclusive cities.

Course Contents

Unit 1: Understanding Inclusion

Historical context and evolution of inclusive city concepts; Definitions of the term inclusion and how the concept of inclusion relates to concepts of equity, diversity, social integration, participation; Significance of inclusivity in urban planning; Understanding inequality in urban spaces: social, economic, and spatial dimensions; Key issues: poverty, homelessness, access to services, discrimination; Introduction to marginalized groups in cities: poverty, gender, age, physical ability; Multidimensional nature of inclusion- spatial aspects of inclusion.

Unit 2: Theoretical Perspectives on Inclusive Cities

Understand how different theories such as social justice theory (John Rawls), capability approach (Amartya Sen), right to the city approach (Lefebvre), intersectionality theory (Crenshaw), critical disability theory, post-colonial theory (Edward Said), Political Economy (Harvey) inform the idea of inclusive cities.

Unit 3: Planning for Inclusive Cities

Key frameworks like The Habitat III Agenda and the New Urban Agenda, Sustainable Development Goals (SDGs) with a focus on Goal 11 (Sustainable Cities and Communities), The concept of Universal Design and accessibility in urban planning. Definitions of accessibility and universal design; Designing for persons with disabilities, elderly populations, and others with mobility issues; Gender and urban planning; Age-friendly cities; Addressing issues of income poverty through urban planning; Addressing inclusion challenges through statutory planning.

Unit 4: Current Practices in Inclusive Cities

International and national case studies in inclusive planning and key challenges in inclusion. Medellin, Colombia Curitiba, Brazil, Barcelona, Spain, Indian case studies: Delhi, Pune, Kochi, Bhubaneshwar; Other relevant international and national cases; Barriers to inclusive planning: structural, social and environmental barriers.

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

- to identify key characteristics and processes underpinning the idea of inclusive cities;
- to know strengths and limitations of different perspectives on inclusive cities;
- to critically evaluate existing frameworks for inclusive cities and apply them to a policy, practice or plan from the inclusivity perspective
- to appreciate challenges of planning for inclusive cities.

References:

1. Gehl J. (2010). Cities for People. Island Press, Washington D.C.
2. Mitchell D. (2003). The Right to the City: Social Justice and the Fight for Public Space. Guilford Press, New York.
3. Sennett R. (2017). The Open City: In the Post-Urban World. Routledge, London.
4. World Bank (2020). Handbook for Gender-Inclusive Urban Planning and Design. World Bank.
5. Anttiroiko A.V. and Jong M. de (2021). The Inclusive City: The Theory and Practice of Creating Shared Urban Prosperity. Springer Nature, Switzerland.
6. Bailey A. and Kei Otsuki (2025). Inclusive Cities and Global Urban Transformation: Infrastructures, Intersectionalities, and Sustainable Development. Springer Nature, Berlin.
7. Asian Development Bank (2020). Enabling Inclusive Cities: Tool Kit for Inclusive Urban Development. Philippines.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Technology and Sustainable Cities***
No. of Credits	*2 (L: 2; T:0; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understanding of technology's pivotal role in shaping sustainable urban development. By exploring smart infrastructure, digital governance, and relevant policy frameworks
- to gain insights about data-driven solutions that address modern urban challenges.

Course Contents

Unit 1: Introduction to Sustainable Cities and Technology

Definition and Principles of Sustainable Cities: Overview of sustainable cities, key principles, and their significance in urban development.; Role of Technology in Urban Sustainability: Technological advancements contribute to sustainable urban development, including smart infrastructure, energy efficiency, and digital governance; Challenges in Sustainable Urbanization: major obstacles to achieving sustainable urbanization, including environmental, social, economic, and governance challenges.

Unit 2: Smart Infrastructure

Energy-Efficient Buildings and Smart Grids: Designing sustainable buildings and integrating smart grid technology to enhance energy management.; Waste Management Technologies and Circular Economy: Innovative waste solutions and the role of circular economy principles in reducing urban waste; Transportation Systems: Enhancing mobility through smart transport solutions and public transit optimization.; Smart Water Management: Technologies and strategies for sustainable water use, conservation, and real-time monitoring.

Unit 3: Digital Transformation and Smart Governance

Role of ICT in City Planning and Governance: Impact of ICT on urban planning, governance, and decision-making.; Urban computing and Modelling: Using data analytics, AI, and simulation models to optimize urban services and infrastructure.; Citizen Science and Engagement: Digital tools for participatory governance, crowdsourcing, and fostering community involvement in urban development.

Unit 4: Future Trends

Emerging Urban Technologies: Exploring the impact of edge computing, blockchain, and next-gen wireless technologies like 6G.; Ethical and Social Implications: Addressing privacy, algorithmic bias, and data ethics in tech-enabled cities.; Governance Models and Public-Private Partnerships: Collaborative strategies for inclusive and effective urban governance.; Case Studies and Policy Recommendations: Real-world examples and actionable policy approaches to foster innovation and long-term sustainability.

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

- to understand how technology contributes to building sustainable and smart cities.
- to utilize ICT tools for efficient urban governance and management.
- to develop innovative, technology-driven solutions to address urban sustainability challenges.

References:

1. Townsend A. M. (2013). Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia. W.W. Norton & Company, New York.
2. Batty M. (2018). Inventing Future Cities. The MIT Press, Massachusetts.
3. Picon A. (2015). Smart Cities: A Spatialised Intelligence. Wiley, New York.
4. United Nations Habitat. (2020). World Cities Report: The Value of Sustainable Urbanization. UN-Habitat, Nairobi.
5. Shi W., Goodchild M. F., Batty M., Kwan M. & Zhang A. (2021). Urban Informatics. Springer Nature, Berlin.
6. Sushil Kumar Singh, Bal Virdee, Rajendrasinh Jadeja (2024). Building Tomorrow's Smart Cities with 6G Infrastructure Technology. IGI Global, Pennsylvania.
7. Croci E. and Benedetta Lucchitta (2021). Nature-Based Solutions for More Sustainable Cities: A Framework Approach for Planning and Evaluation. Emerald Publishing Limited, Bingley.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Advanced Spatial Data Analytics***
No. of Credits	*2 (L: 4; T:2; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to advanced skills in spatial data analytics, emphasizing the integration of big data technologies, machine learning, and cloud platforms to solve real-world urban planning challenges.
- to gain hands-on experience in processing, analysing, and visualizing spatio-temporal data for informed spatial decision making.

Course Contents

Unit 1: Introduction to Advanced Spatial Data Analytics

Spatial Computing and Big Data Analytics: Fundamentals of spatial data processing in the context of large and complex urban datasets.; Distributed and Parallel Computing: Concepts and tools enabling scalable analysis of spatial data.; NoSQL Databases and Spatial Data Storage: Techniques for handling non-relational spatial databases and managing large-scale geospatial data.; Spatial Analysis Tools: Use of Python-based libraries such as ArcPy and GeoPandas for geospatial analysis.; Cloud-based GIS Platforms: Introduction to platforms like Google Earth Engine, AWS, and ArcGIS Online for spatial data processing in the cloud.

Unit 2: Spatial Data Mining Techniques

Spatial Association Rule Mining: Discovering spatial patterns and co-locations.; Clustering and Hotspot Detection: Techniques for identifying spatial clusters and significant activity areas.; Spatial Classification and Regression: Applying supervised learning methods to spatial problems.; Outlier Detection and Anomaly Analysis: Identifying unusual spatial behaviours and detecting anomalies.

Unit 3: Advanced Machine Learning Techniques for Spatio-temporal Data

Data Aggregation Techniques: Collecting spatial data from APIs, UAVs, high-resolution imagery, and other sources using various tools.; Collaborative Filtering for Spatiotemporal Data: Recommender systems and filtering techniques adapted for spatial and temporal data.; Tensor Decomposition: Concepts and applications for extracting latent patterns in spatiotemporal datasets.; Probabilistic Graphical Models: Using Bayesian networks and other probabilistic models to model complex spatial relationships.; Deep Learning Applications: Leveraging ANN, CNN, and R-CNN for image classification, object detection, NLP, and text analysis in spatial contexts.; Reinforcement Learning: Fundamental concepts, tabular and approximate methods applied to spatial decision environments.

Unit 4: Applications and Future Trends

Urban Growth and Land Use Change Modelling: Advanced techniques for predicting and simulating urban expansion.; Location-Based Services and Mobility Analysis: Analyzing real-time location data for urban insights.; Disaster Risk Assessment and Climate Resilience: Using spatial tools for hazard modelling and planning resilient cities.; Real-Time GIS and Dynamic Data Visualization: Interactive dashboards and streaming data for spatial monitoring and analysis.

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

- to apply advanced spatial analysis techniques to urban planning datasets.
- to develop predictive models using machine learning for spatial decision-making.
- to interpret and visualize spatial patterns using statistical and AI-driven methods.
- to solve real-world urban planning problems using spatial big data.

References:

1. Li D., Wang S., and Li, D. (2016). Spatial data mining: Theory and Application. Springer, Berlin.
2. Zheng Y. (2019). Urban computing. MIT Press, Massachusetts.
3. Goodfellow I., Bengio Y., and Courville A. (2016). Deep learning. MIT Press, Massachusetts.
4. Bahga A. and Madisetti V. (2016). Big Data Science & Analytics: A Hands-On Approach. VPT, New Delhi.
5. McClain, B. P. (2022). Python for geospatial data analysis. O'Reilly Media, Inc., California.
6. Manimala G. (2024). Mastering Big Data Analytics: Tools Techniques and Best Practices. Notion Press, Chennai.
7. Balas V., Sanjiban Sekhar Roy and Dharmendra Sharma (2023). Handbook of Deep Learning Applications. Springer Nature, Switzerland.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	***Energy and Planning***
No. of Credits	*2 (L:4; T:2; U:0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand green and inclusive growth, and also generate economic, health, and environmental benefits
- to create a stable and predictable investment environment, and provides a framework for just energy transition with renewable energy deployment and the design of suitable energy sector policies.
- to robust energy system planning such plans and policies by allowing for system-wide considerations of security of supply, energy access, affordability, environmental impacts and investment needs.

Course Contents

Unit 1: Energy Efficiency Tools and Approaches

Understanding linkages of Energy Efficiency with Public Lighting, Water and Wastewater, Solid Waste Management, Public Buildings, transport; Introduction to Energy Savings Performance Contracts, Power purchase agreements, Tool for Rapid Assessment of City Energy; understanding coefficient of GHG emissions pertaining to different emissions in city; Understanding Micro Climate & Thermal Comfort; design approaches for five Climate Zones; understanding of codes for energy conservation in commercial and residential buildings; various sustainability certification systems for buildings and area schemes with focus on energy; Energy Performance-based Building Design; Introduction to Renewable Energy Use in Buildings and concept of solar cities and other related.

Unit 2: Energy Conservation

Energy Conservation in Buildings and Areas: introduction to Net Zero buildings including case studies; understanding psychrometric chart; Understanding the Building Envelope; Energy Efficient Roofing & Walling Systems; Energy Efficient Fenestrations & Glazing Technologies; Low Embodied Energy Materials & Technology; Insulation Materials and Techniques; Importance of Lighting Efficiency and Lighting Technologies; Designing for Optimum Natural Light; Overview of Renewable Energy Sources; Integrating Solar Energy Systems.

Unit 3: HVAC Systems

Introduction to HVAC Systems & Energy-Efficient Heating Options; Energy-Efficient Cooling Options & HVAC Optimization Strategies; not-in-kind cooling system, district cooling systems, renewable sources for cooling like blue and green infrastructure, Economic and Environmental Benefits of Renewable Energy; Energy-Efficient Campuses Case Studies

Unit 4: Energy Auditing and Renewable Energy Integration

Introduction to Energy Auditing; Introduction to energy management systems; real-world examples of energy-efficient areas schemes/gated communities/institutional/educational compounds; energy efficiency and renewable energy integration in: highways, truck/logistic parks, freight parks, cold storage for agriculture, water pumping for agriculture; renewable energy integration with buildings, public infrastructure, public amenities, and its integration with development controls; Understanding of GHG emissions for city operations and baseline for public buildings, projecting consumption based on ambient temperature increase, and enabling reduction through various approaches including efficiency, conservation and offsets.

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

- to demonstrate opportunities for cities to be drivers of energy transition

- to formulate pragmatic advice for building energy sector and municipal energy sector decarbonisation.

References:

1. Blaikie P. (1994). At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge, London.
2. Khazaii J. (2016). Energy-efficient HVAC design. Springer International Publication, Berlin.
3. Bureau of Energy Efficiency (2024). Energy Conservation and Sustainable Building Code. Ministry of Power, New Delhi.
4. Bureau of Energy Efficiency (2018). Eco Niwas Samhita. Ministry of Power, New Delhi.
5. Roychowdhury A., Rajneesh Sareen and Sugeet Grover (2023). The Cooling Web: Calibrating cooling-energy requirements in buildings. Centre for Science and Environment, New Delhi.
6. Lackner M., Baharak Sajjadi and Wei-Yin Chen (2020). Handbook of Climate Change Mitigation and Adaptation. Springer Nature, Berlin.
7. Roychowdhury A., Rajneesh Sareen, Mitashi Singh and Nimish Gupta (2025). Planning and Designing Habitat in Climate-Risked Times: Heat Toolkit. Centre for Science and Environment, New Delhi.

ourse Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Planning Studio – Future Cities***
No. of Credits	*8 (L:0; T:2; U:12)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to come out with innovative ideas for a new planned city which are futuristic cities.

Course Contents

Earlier studios where the students understood the existing city and regional plan preparation. Based on the earlier experiences, students will be given the details of a plan for a utopian city or a region based on technological revolution (such as virtual AI), future socio-economic scene, health, disaster, and other dimensions and present a spatial three D - form and plans. A student will be given ideas on specialized cities like Technology cities, Healthy city, Aero cities, financial cities, etc.

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

- to simulate the futuristic cities with advanced technologies, AI based cities, infrastructure, governance and coming out with advanced planning scenarios.

Note: <u>The students accompanied by their studio incharge/s should visit the selected site/area/city/region for 7-10 days to collect the data required for the present studio exercises.</u>

References:

1. Gehl Jan (2010). Cities for People. Island Press, Washington D.C.
2. UN-Habitat (2022). Planning for Future Cities: A Global Perspective. United Nations Human Settlement Programs, Nairobi.
3. Khandelwal R. (2023). Cities of the Future. Book Street Publications, Noida.
4. Chatterje U., Arindam Biswas, Jenia Mukherjee and Sushobhan Majumdar (2022). Advances in Urbanism Smart Cities and Sustainability. CRC Press, Florida.
5. Simpson S.D. (2023). The Future of Smart Cities. Nova Publishers, New York.

Tenth Semester						
Course Code	**Title of the Course**	**Nature of the Course**	**Credits**			**Total Credits**
			L	**T**	**U**	
As per Institutional Policy	Modelling Urban Dynamics	Major	2	1	0	3
	Climate Resilient Cities	Major	2	1	0	3
	Economic Policy and Local Development	Minor	2	0	0	2
	Planning Studio – Planning Thesis	Major	0	5	14	12
	Total Credits					**20**

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Modelling Urban Dynamics***
No. of Credits	*3(L: 2; T:1; U: 0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to impart knowledge about urban dynamics functions from national and international literature, case studies
- to understand various methods of modelling and visualising urban dynamics.

Course Contents

Unit 1: Basics of Modelling

Why urban modelling? Introduction to urban structure and changes in urban fabric related to size, typology, urban functions, economy, housing, services and institutions.

Unit 2: Planning Models

System theories (general system theory and systems approach); System dynamics models and its application in modelling/ forecasting urban dynamics; Merits and demerits of system dynamics model; Introduction of software packages for modelling and simulation; Entropy Maximisation, NBER Model, Mills Maximisation Model, urban-peri-urban models, and other models.

Unit 3: Land and Housing Models

Urban dynamics and order of cities/city regions due to globalisation; Urban growth, poverty and inequality; Urban structure, land and housing market dynamics, utility and housing inequality; urban form and its interrelations with urban microclimate, energy infrastructure and mobility systems; Anderson-Lundquist Stockholm Model, Urban Housing Institute Model, Housing Urban disaggregated model, and others.

Unit 4: Application of Models

Statistical and spatial visualisation of urban dynamics through anticipatory models; Understanding and evaluating different models of interpretation; Understanding urban policy to address various issues.

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

- to do critical thinking, information literacy and local to global engagement on urban issues and challenges

References:

1. Mohan Rakesh (1976) : Toward Modelling Poor Cities: A Review of Urban Economic and Planning Models. World Bank Staff Working Paper No. 232. The World Bank. April 1976.
2. Forrestor, W.J. (1969), Urban Dynamics, MIT Press.
3. Mohan, R. (1994). Understanding the Developing Metropolis Lessons from the City Study of Bogoti and Cali, Colombia, Oxford University Press.
4. Alexander, C., Ishikawa, S. Silverstein, M., Jacobson, M., Fiksdahl-King, I., and Angel, S. (1977). A Pattern Language: Towns, Buildings, Construction, Oxford University Press.
5. Sassen, S. (1998). Globalization and Its Discontents, The New Press.
6. Sassen, S. (1991). Housing by People: Towards Autonomy in Building Environments, Marion Boyars; Reprint edition.

Course Code	*As per Institutional Policy*
Nature of Course	***Major***
Course Title	***Climate Resilient Cities***
No. of Credits	*3 (L:2; T:1; U:0)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to tackle climate crisis in cities with the help of adaptive and mitigation measures
- to understand modification of bye-laws, strategic planning, and innovative design including harnessing solar potential and integration of sustainable cooling systems

Course Contents

Unit 1: Basics of Urban Resilience

Importance of urban resilience in the context of climate change and social equity; Climate challenges and effective strategies for resilience; Extreme weather events, disasters and climate resilient cities: knowledge on disaster profile of India; policy and institutional frameworks; water sensitive urban design and planning - concept of sponge cities, heat action plan, introduction to low embodied carbon materials; Eco Niwas Samhita; exploring the potential of renewable energy in cities.

Unit 2: Baseline Assessment

Climate baseline assessment; exploring the history of land use and urban development, urban sprawl and fossil fuel dependence including reliance on vehicles; understanding of related policies and politics; comprehending the social, economic, and environmental risks associated with various land use patterns including forests, coastlines, and urban centers; comparing new development pockets on urban morphology, urban cover, land cover and anthropogenic indicators and other related for decision making on low impact development.

Unit 3: Risk and Vulnerability Assessment

Risk assessment and vulnerability assessments relating climate risks and disaster/extreme events risks; Evolution of urban planning including New Urbanism, Smart Growth, and other planning frameworks developed in response to urban sprawl, car dependence, and environmental degradation; evidence gathering on how environmental law and policy have influenced land use and development patterns; evaluating sustainability practices and policies through an equity lens exploring how urban planning can promote social and economic equity.

Unit 4: Application of Technology in Resilience

Remote Sensing / GIS based Differential Elevation Modelling and LST analysis for future prediction of Flood and Heat in urban centres, superimposing the other parameters of Air quality, water supply, sanitation, electricity, health, transportation, housing, cooking fuel, awareness, etc. for carrying out ward level vulnerability assessments; providing design solution at city scale, neighbourhoods scale, area scale considering design and other infrastructure retrofits especially through water sensitive urban design and planning, heat action plans, cooling master plans, among others.

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

- to understand the utilization of several learnt measures one can safeguard public health, enhance urban liveability, build resilience to climate change, contribute to national climate goals
- to cover the critical aspect of vulnerability and risks in urban areas and address key components relating to disaster and climate risk reduction, finally manage and build climate resilience in cities.

References:

1. Kapur Anu. (2010). Vulnerable India: A Geographical Study of Disasters. Sage Publications India Pvt. Ltd, New Delhi.
2. Gupta M.C., L.C. Gupta, B.K. Tamini and Vinod K. Sharma (2000). Manual on Natural Disaster Management

in India. National Disaster Management Centre, New Delhi.
3. Rosenzweig C., Solecki, W.D., Hammer, S.A. and Mehrotra S.P. (2011). Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network (ARC3). Cambridge University Press, Cambridge.
4. Richard Mahapatra, S.S Jeevan, Snigdha Das (2017). Environment Reader for Universities. Centre for Science and Environment.
5. Narain S. (2018). Climate Change Reader for Universities. Centre for Science and Environment, New Delhi.
6. Lackner M., Baharak Sajjadi and Wei-Yin Chen (2020). Handbook of Climate Change Mitigation and Adaptation. Springer Nature, Berlin.
7. Roychowdhury A., Rajneesh Sareen, Mitashi Singh and Nimish Gupta (2025). Planning and Designing Habitat in Climate-Risked Times: Heat Toolkit, Centre for Science and Environment, New Delhi
8. Roychowdhury A., Rajneesh Sareen and Sugeet Grover (2023). The Cooling Web: Calibrating cooling-energy requirements in buildings. Centre for Science and Environment, New Delhi

Course code	As per institutional policy
Nature of course	**Minor**
Course Title	**Economic Policy and Local Development**
No. of Credits	2 (L:2; T:0; U:0)
Internal Assessment	As per Institutional Policy
End Semester Assessment	As per Institutional Policy

Course Objectives: The student will be enabled

- to know the economic policy making from national, state and below level. this will also make them understand the links between global economic trends and its interface with national policies.
- to understand the various economic policies and what level it is made in India.
- to know the process of economic policy making at local level and to make them as engines of economic growth in tune with spatial planning.

Course Contents

Unit 1: National Economic Institutions and Economic Policies Impetus

Component of Economic Policies and Institutions: Ministry of Finance and its role in Economic Policies; Role of Reserve Bank of India and its roles through Monetary Policy, Role of Ministry of Industries and Commerce; Ministry of Agriculture and agricultural policy; Role of ministry of railways, surface transport and Ports in economic policy decisions. Role of Confederation of Industries, FICCI, ASSOCHAM, etc. Role of the Ministry of Labour, and the Role of the Ministry of Environment and Forest, etc.

Unit 2: Links between Sectors and State Policies

Central Ministries Economic Policies and its interface with State level departments; State's Economic Policies and their institutions; Sectoral Policies at State Level: Agriculture, Industries, Trade and Commerce, Economic Infrastructure, Special Economic Infrastructure: Industrial Infrastructure and its interface with Spatial Planning, EPZ, SEZ, Investment Zones, Tech Parks, Medical Parks, Investment Parks, etc.

Unit 3: Economic Policy Visioning

National Economic visioning and projections, Sectoral Strategies to achieve those visions; State level visioning and strategies; Interface of National and State Economic Visions and Strategies and Spatial Planning: Gaps in spatial economic policies and planning through spatial planning. Integrating Engines of Economy at local levels to national levels with spatial planning.

Unit 4: Local Economic Development and Policies (LED)

Local Economy Assessment: Economic Surveys and Gap Analysis and filling up the gap; Economic Strategy Making:- Step 1- Creating a Vision, Step-2 Developing the Economic Goals, Step 3- Development Objectives, Step 4- Development Programmes, Step 5- Selecting Projects that can infuse development, Preparing Implementation Plan through spatial development, Individual Action Plan and link it micro spatial plans, Build Institutional framework for LED, Monitoring and Evaluation.

Course Outcome: Upon the completion of this course, the students will be able

- to process the making of economic policy, sectoral policies, and their interface with spatial planning.
- to apply the method of making the local economic policy
- to integrate them with spatial planning generating economic engines at that level.

References:

1. Blair, John P. (1996). Local Economic Development: Analysis and Practice. Sage Publications, Inc., California.
2. Clarke S.E. and Gaile G.L. (1992). The Next Wave: Post-federal Local Economic Development Strategies. Sage Publications, California.
3. Mier R. and Bingham R. (1993). Metaphors of Local Economic Development in Theories of Local Economic Development: Perspectives from Across the Disciplines. Sage Publications, California.
4. The World Bank (2006): The Local Economic Development Primer. Washington D.C.
5. Malizia E., Edward J. Feser, Henry Renski and Joshua Drucker (2020). Understanding Local Economic Development. Routledge, London.
6. Leigh N.G.(2024). Planning Local Economic Development:Theoryand Practice. Sage Publications, Inc., California.

Course Code	*As per Institutional Policy*
Nature of Course	***Minor***
Course Title	**Planning for Special Areas**
No. of Credits	2 (L:2; T:0; U:0)
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to understand the typology of special areas in India and abroad.
- to define the salient features of special areas on different dimensions and its links with the main city.
- to explain the governance framework of special areas.
- to identify the infrastructure requirements for special areas; and,
- to understand the various programmes and policies for special areas.

Course Content

Unit 1: Classification of Special Areas

Evolution and need for special area planning: Defining special areas; typology of formal and functional special areas: border areas, coastal, economic areas, investment areas, logistic areas, port city, acropolis, Medi-city; knowledge city, heritage areas, defence areas, etc.

Unit 2: Characteristics of Special Area

Socio-Economic, physiographic, geographic and political features of special areas. Functions and their performance. Interlinks of special areas with the mother city and region.

Unit 3: Infrastructure of Special areas

Unique infrastructure needs of special areas; planning standards for special areas; capital investment and funding methods, PPP and development process. collaboration within India and abroad.

Unit 4: Governance of Special Area

Legislation and governance framework of special areas; territoriality and governance of special areas: who controls and maintains; land management in special areas; survey statutes governing special areas; Interface between institutions within special areas and outside. Infrastructure governance and its application, pricing and investments.

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

- to delineate the functional domain of special areas.
- to collate and tabulate the information on socio-economic, geo, historical, physical and political features;
- to analyse the land management system of special areas;
- to identify planning issues for special areas;
- to understand the relevant acts, standards, programme and policies for special areas.

References:

1. Gupta, KR (2008): Special Economic Zones: Issues, awas and Procedures. Atlantic Publishers. Delhi.
2. Ministry of Home Affairs(2008): Border Area Development Programme Guidelines. New Delhi.
3. Ministry of Environment and Forest (2011) CRZ Regulations. New Delhi.
4. Kasandra J. and Lindsay Greg (2020). Aerotropolis: The Way we will Live Next. Allen Publisher, New Jersey.
5. NITI AAYOG (2022). Hill Areas Development. Government of India, New Delhi.
6. Sharma V. (2021). Environmental Problems of Coastal Areas in India. Bookwell, New Delhi.

Course Code	*As per Institutional Policy*
Nature of Course	*Major*
Course Title	***Planning Studio - Planning Thesis***
No. of Credits	*12 (L: -0; T:-5; U: -14)*
Internal Assessment	*As per Institutional Policy*
End Semester Assessment	*As per Institutional Policy*

Course Objectives: The student will be enabled

- to develop a basic understanding of the area chosen for study (by carrying out a detailed literature review).
- to undertake detailed exploration of the topic (by way of surveys and studies).
- to identify issues and concerns those emerge out of the study and suggest recommendations.

Course Contents

Guided research by a student under the supervision of an individual/group of faculties from formulation to submission of the research.

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

- to enhance ability to critically analyse complex housing issues and data, developing a keen understanding of underlying problems and trends.
- to advance research skills, including designing studies, collecting and analysing data, and synthesizing information from multiple sources.
- to improve problem-solving abilities, with a focus on developing practical and innovative solutions to housing challenges.
- to increased attention to detail in conducting research, analysing data, and presenting findings, ensuring accuracy and thoroughness.
- to experience in managing a research project from inception to completion, including planning, executing, and reviewing progress.

SECTION IV

BASKET OF VALUE-ADDED AND ELECTIVE COURSES

4.1. List of Value-Added Courses (As Per NEP)

1. Environmental Studies
2. Drug Abuse
3. Universal Human Values
4. Human Rights and Constitutional Duties
5. Gender Sensitivity
6. Indian Languages and Knowledge System
7. Global Citizenship Inclusion and Equity
8. Creativity and Critical Thinking
9. Health and Yoga

4.2. Basket of Proposed Electives

1. Construction Technology Innovation and its Impact on Real Estate
2. Designing for Real Estate (Urban Design, and Landscape)
3. Facility Management
4. Land value capture ToD, TDR & Commercial Real Estate Management
5. Housing Portfolio Investment
6. Stakeholder Management and Governance
7. Project Implementation and Management
8. Global Real Estate Economics and Economics Development
9. Data Analytics
10. Land Economics
11. Planning for Tourism
12. Landscape Planning and Design
13. Community Participation in Planning
14. Heritage and Conservation
15. Urban Future
16. Urban Mobility & Intelligent Transport System
17. Peri-Urban Development Planning
18. Urban Design
19. Big Data and Python
20. Planning for Sustainable Settlements
21. Environment Management Conservation
22. Planning for Special Areas
23. Citizen Social Science in Spatial Governance
24. Green Governance: Behaviour, Leadership and Entrepreneurship
25. State and Market Decisions
26. Disaster Management
27. Future Cities
28. Legal Studies
29. Healthy Cities and Spatial Policy
30. Fiscal Policy and Governance Decentralisation
31. Circular Economy, Spatial Governance and Policy
32. SIS for Emergency Response Planning
33. Spatial Data Security
34. Spatial Data Driven Journalism

35. Facility Management
36. Land Value Capture Tod, TDR & Commercial Real Estate Management
37. Housing Portfolio Investment
38. Project Implementation and Management
39. Stakeholder Management and Governance
40. Citizen Social Science in Spatial Governance
41. State and Market Decisions
42. Risk and Disaster Management
43. Healthy Cities and Spatial Policy
44. Fiscal Policy and Governance Decentralisation
45. Circular Economy and Spatial Governance and Policy
46. SIS For Emergency Response Planning
47. Spatial Data Security
48. Spatial Data Driven Journalism
49. Sustainable Real Estate Development
50. Disaster and Resilience
51. Inclusion, Participation and Communication
52. Inclusive Planning
53. Port Planning and Logistics
54. Blue-Green Economy
55. Advanced Environmental Impact Assessment
56. Eco-System Services for Settlement Planning
57. Infrastructure Policy (Energy, Water and Transport)
58. Degraded Land Management
59. Strategic Science and Spatial Planning

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