



योजना तथा वास्तुकला विद्यालय, विजयवाड़ा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, Ministry of Education Gov. of India

17th Meeting of the Senate

School of Planning and Architecture, Vijayawada

May 27th 2024, 11:00 Hrs
held at Board Room, 1st Floor, Academic Block, SPAV Campus

Minutes of the Meeting

SPAV Campus
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India.

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निदेशक, विद्यालय
योजना तथा वास्तुकला विद्यालय
School of Planning and Architecture
विजयवाड़ा | Vijayawada



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Minutes of the 17th Meeting of the Senate of SPAV

held on 27th May 2024 at 11:00Hrs

at Board Room, 1st Floor, Academic Block, SPAV Campus

(and also through -- meet.google.com/sxj-ybgf-qbz as Hybrid mode)

The following members were present:

S.No.	Name	Designation
1	Prof. Dr. Ramesh Srikonda, Director, SPA Vijayawada	Chairperson
2	Prof. Dr. S. P. Sekar Professor (Retd.) SAP Chennai, ITPI- Nominee	Member
3	Prof. Dr. K. S. Anantha Krishna (<i>attended online</i>) Professor, NITTE, School of Architecture, Planning & Design, Bengaluru (Nominee of Chairperson BoG)	Member
4	Shri. Paramjit Singh Ahuja (<i>attended online</i>) Practicing Architect & Planner, CoA – Nominee	Member
5	Prof. Dr. P. S. Chani (<i>attended online</i>) Professor, IIT Roorkee, (Nominee of Chairperson BoG)	Member
6	Prof. Dr. Ayon Kumar Tarafdar Dean Academic, SPA Vijayawada	Member
7	Dr. Venkata Krishna Kumar Sadhu Dean Student Affairs, SPA Vijayawada	Member
8	Dr. Amitava Sarkar Dean Faculty Welfare, SPA Vijayawada	Member
9	Dr. Adinarayanane R. (<i>attended online</i>) Dean Planning & Development, SPA Vijayawada	Member
10	Dr. Janmejy Gupta (<i>attended online</i>) Dean Research, SPA Vijayawada	Member
11	Dr. Srinivas Daketi Head, Dept of Architecture, SPA Vijayawada	Member
12	Dr. Prasanth Vardhan Head, Dept of Planning	Member
13	Prof. Dr. Iyer Vijayalaxmi Kasinath Professor, Dept of Architecture, SPA Vijayawada	Member
14	Dr. Valliappan AL. Assistant Professor, Department of Planning, SPAV	Member
15	Mr. Sanjay Bhandari (<i>attended online</i>) Assistant Professor, Department of Architecture, SPAV	Member
16	Shri K. V. Uma Maheswara Rao Registrar, SPAV	Secretary
17	Dr. Shanmuga Priya G Associate Professor, Department of Architecture, SPAV	Special Invitee
18	Dr. Khuplianlam Tunngung Associate Professor, Department of Architecture, SPAV	Special Invitee

The following members could not join the meeting due to prior commitments / unavoidable circumstances:



1. Dr. Shikha Jain, Director, DRONAH, Gurugram (Nominee of Chairperson BoG)
2. Prof. Dr. Rajeev Shringi, Professor, Dept of Architecture, MNIT Jaipur, AICTE - Nominee
3. Prof. Dr. Bhanu Mohinder Marwaha, Professor and Head, Dept. of Architecture, National Institute of Technology (NIT) Hamirpur, (Nominee of Chairperson BoG)
4. Shri A Chenithung Lotha, Director, Directorate of Urban Development, Govt of Nagaland. (Nominee of Chairperson BoG)

At the start, the Chairperson-Senate Prof. Dr. Ramesh Srikonda, Director SPA Vijayawada welcomed all members representing organisation of CoA, AICTE and ITPI and from the industry and academics and also extended his gratitude to all others who joined online amidst their busy schedules. Thereafter, the Secretary of the Senate, Registrar of SPA Vijayawada apprised the members about various Agenda Items for the meeting, and initiated the discussions / deliberations leading to decisions as summarised below.

-	Confirmation of the Minutes of the 16th Senate meeting of SPA Vijayawada held on 22nd Aug 2023
Decision	<i>As no comments have been received, the approved Minutes of the 16th Meeting of the Senate of SPA Vijayawada held on 22nd Aug 2023 as circulated on 29th August 2023, is confirmed.</i>

Item # 17.1	To present the Action Taken Report on the 16th Senate meeting of SPA Vijayawada held on 22nd Aug 2023
Proceedings	The Secretary to the Senate, the Registrar of SPA Vijayawada presented the Action Taken Report on the Minutes of the 16 th Senate meeting of SPA Vijayawada held on 22nd Aug 2023 at SPA Vijayawada, which was circulated as part of the Agenda Notes of this 17 th Senate Meeting.
Decision	<i>Senate noted and agreed upon the Action Taken on the Minutes of 16th Senate Meeting.</i>

ITEMS FOR APPROVAL

Item # 17.2	Revision / Update of Syllabus of 03 PG programmes in Planning in line with NEP 2020
Proceedings	The Dean Academic apprised all members that after detailed deliberation and introspection within all faculty of the Department of Planning and ABoS-Planning, considering the experience of running three PG programmes over the last few years, to align the syllabi with the industry demands, the technological advancements in the field, to bring in elements of NEP-2020, and to ensure a wider applicability and resonance with the community, the Department of Planning has revised and updated the syllabus of its three existing PG Programmes in Planning. Thereafter, the Head of Department of Planning

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Proceedings	<p>explained in detail the salient features of the changes suggested in each the three PG programmes. He mentioned that the changes are brought in to:</p> <ol style="list-style-type: none">To primarily align with the TPI Model Curriculum & AICTE model curriculaTo meet the emerging planning professional needs (based on Alumni Feedback / Industry Interaction / NEP), and;To streamline topics that are repeating across the three PG courses and across the modules of various subjects <p>The Head of Dept of Planning also mentioned that revision of syllabus for B.Planning is in progress and shall be completed shortly for further deliberations. After detailed deliberations, the following were suggested by the members:</p> <ol style="list-style-type: none">While preparing the lecture plans of each subject, the teachers should bring out the outcome and objective of each module and teach in an output based strategy for each module'Urban Renewal and Urban Heritage Conservation' subject of MURP to be renamed as 'Urban Renewal and Heritage Conservation'Traffic Infrastructure Design can emphasise more on NMT aspects while preparation of the lecture plans. <p>The points were noted and incorporated, as applicable. After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate appreciated the efforts, approved and recommended the proposed Revised Course Structure and Detailed Syllabus for the following Masters Programmes of studies in Dept of Planning, to be effective for the batches admitted in A.Y. 2024-25 and onwards:</i></p> <ol style="list-style-type: none"><i>Masters in Planning (Environmental Planning and Management)</i> - As per Annexure I to this Minutes<i>Masters in Planning (Urban and Regional Planning)</i> - As per Annexure II to this Minutes<i>Masters in Planning (Transport Planning)</i> - As per Annexure III to this Minutes
Item # 17.3	Revision / Update of Syllabus of 03 PG programmes in Architecture in line with NEP 2020
Proceedings	<p>The Dean Academic apprised all members that similar to the previous Agenda Item, after detailed deliberation and introspection within all faculty of the Department of Architecture and ABoS-Architecture, considering the experience of running three PG programmes over the last few years, to align the syllabi with the industry demands, the technological advancements in the field, to bring in elements of NEP-2020, and to ensure a wider applicability and resonance with the community, the Department of Architecture has revised and updated the syllabus of its three existing PG Programmes in Architecture. Thereafter, the Head of Department of Architecture explained in detail the salient features of the changes incorporated in each the three PG programmes. He requested Asst Prof. Sanjay Bhandari, Dr. Shanmuga Priya G. and Prof. Dr. Iyer Vijayalaxmi Kasinath, to explain the salient features of the key changes for M.Arch</p>



Proceedings	<p>(Architectural Conservation), M.Arch (Landscape Architecture) and M.Arch (Sustainable Architecture) respectively. The Head of Dept of Architecture also mentioned that revision of syllabus for B.Architecture and the courses of MBEM and MUD is in progress and shall be completed shortly for further deliberations. After detailed deliberations on each of the three PG programmes and their key changes, the following were suggested by the members:</p> <p>i. While preparing the lecture plans of each subject, the teachers should bring out the outcome and objective of each module and teach in an output based strategy for each module</p> <p>ii. The subject of 'Research Methodology and Dissertation' can be renamed as 'Research Methodology' only, for Masters in Landscape Architecture Course Structure</p> <p>iii. In Masters in Sustainable Architecture, the aspects of embodied energy and water footprints to be emphasized in the certain subject and studios of 2nd and 3rd sem.</p> <p>The points were noted and incorporated, as applicable. After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate appreciated the efforts, approved and recommended the proposed Revised Course Structure and Detailed Syllabus for the following Masters Programmes of studies in Dept of Architecture, to be effective for the batches admitted in A.Y. 2024-25 and onwards:</i></p> <p>a) Masters in Architecture (Architectural Conservation) - As per Annexure IV to this Minutes</p> <p>b) Masters in Architecture (Landscape Architecture) - As per Annexure V to this Minutes</p> <p>c) Masters in Architecture (Sustainable Architecture) - As per Annexure VI to this Minutes</p>
Item # 17.4	<p>Proposal of two new PG programmes in Planning to be initiated within next five academic years</p>
Proceedings	<p>The Head of Department of Planning, after detailed deliberation and introspection with all faculty of the Department and Advisory Board of Studies-Planning, and in line with industry demand and developments of state-of-the-art in the field of planning have envisaged the start of two new PG programmes in the Department within the next 05 years. This is also related to the preparations for the revised DPR of SPAV for next five years, for which, work is in progress. The nomenclatures of the proposed 2-year PG programmes in Planning were presented by HoD-Planning along with details of programme outcome and eligibility for admissions.</p> <p>a) 'Masters in Planning' with Specialization in 'Data Analytics in Planning' (02 Years Full-time)</p> <p>b) 'Masters in Planning' with Specialization in 'Housing and Real Estate Planning' (02 Years Full-time)</p> <p>After detailed deliberations, the Senate decided as below:</p>



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Decision	<p><i>The Senate considered, approved and recommended the following nomenclatures of 2-years full-time Masters programme in Dept of Planning to be introduced within the next 5 years:</i></p> <ul style="list-style-type: none">a) <i>'Masters in Planning' with Specialization in 'Data Analytics in Planning' (02 Years Full-time)</i>b) <i>'Masters in Planning' with Specialization in 'Housing and Real Estate Planning' (02 Years Full-time)</i> <p><i>The Senate also asked the Department to prepare the Course Structure and Detailed Syllabus for each of the same and put up to Senate for approval in subsequent meetings.</i></p>
Item # 17.5	<p>Proposal of three new PG programmes in Architecture to be initiated within next five academic years</p>
Proceedings	<p>The Head of Department of Architecture, after detailed deliberation and introspection with all faculty of the Department and Advisory Board of Studies-Planning, and in line with industry demand and developments of state-of-the-art in the field of Architecture have envisaged the start of three new PG programmes in the Department within the next 05 years. This is also related to the preparations for the revised DPR of SPAV for next five years, for which, work is in progress. The nomenclatures of the proposed 2-year PG programmes in Architecture were presented by HoD-Architecture along with details of programme outcome and eligibility for admissions.</p> <ul style="list-style-type: none">a) Masters in Interior Designb) Masters in Digital Architecture (02 Years Full-time)c) Masters in Traditional-Techno Architecture (02 Years Full-time) <p>After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate considered, approved and recommended the following nomenclatures of 2-years full-time Masters programme in Dept of Architecture to be introduced within the next 5 years:</i></p> <ul style="list-style-type: none">a) <i>Masters in Interior Design</i>b) <i>Masters in Digital Architecture (02 Years Full-time)</i>c) <i>Masters in Techno-Traditional Architecture (02 Years Full-time)</i> <p><i>The Senate also asked the Department to prepare the Course Structure and Detailed Syllabus for each of the same and put up to Senate for approval in subsequent meetings.</i></p>
Item # 17.6	<p>Approval of Detailed Syllabus for M.Design to be initiated from AY 2024-25</p>
Proceedings	<p>As per the decision of 16th Senate of SPAV, detailed syllabus for each subject for the approved syllabus is to be developed with five modules and suggested readings similar to other PG programs in SPA Vijayawada and placed for approval. Upon request from the Head of Architecture, Dr. Khuplianlam Tungnung presented in depth, the detailed syllabus with modules and reading list.</p>



Decision	<i>The Senate considered, approved and recommended the proposed Revised Course Structure and Detailed Syllabus for Master of Design 2 years programme of study in Dept of Architecture, to be effective for the batches admitted in A.Y. 2024-25 and onwards (as per Annexure VII to this Minutes).</i>
Item # 17.7	Approval of initiating SWAYAM / NPTEL / MOOC courses aligned with the programmes of study for Dept of Architecture and Planning, as 'Programme Based Open-Audited Courses (PBOC)'
Proceedings	<p>It was apprised to all Senate members that, the Department of Architecture and the Department of Planning, after detailed deliberation and introspection with all faculty of the Department and ABoS, have envisaged to encourage its students to take up subjects and courses available in online platforms like SWAYAM, NPTEL, MOOC etc., as 'Programme Based Open-Audited Course (PBOC)', which are aligned with Architecture and Planning discipline, and are as per course structure. In view of the same, the Departments have identified a list of courses available in online platforms of repute and placed as Annexure to the Agenda Items. In line with this, after detailed deliberations amongst Senate members, the modalities of taking up SWAYAM / NPTEL / MOOC courses, is as concluded below:</p> <ol style="list-style-type: none">Students may be allowed to choose from the declared list of online courses by the Department and complete the same as a PBOC.The courses should be of minimum 24 hours/08 weeks in contact duration as offered by the host Institution and should culminate in an assessment.Students opting for such courses have to bear the cost of the course, without any implication on the Fees of SPAV.Completion certificates of such PBOC, shall be submitted by the student to the Department which shall compile and submit the same to the Exam Section at the start of a semester for the courses taken prior to that semester, so that it can be acknowledged in the credentials of the student as 'Programme Based Open-Audited Courses (PBOCs)' without counting such courses in the calculation of CGPA/SGPA.The courses have to be taken without impacting the time-table of the Department at SPAV. Students have to declare their option of the online course before the start of the semester through an application process and get the same approved by the HoD or ABoS.Each PG and UG student to complete minimum one such course per semester.Upon completion of two semesters of PBOCs in both Departments and evaluating the success of the same, the Departments shall consider integrating PBOCs as regular courses by offering them as electives or core subjects in certain semesters, for which detailed modalities are to be worked out by specialized committee. <p>After detailed deliberations, the Senate decided as below:</p>
Decision	<i>The Senate considered, approved and recommended the initiative and accorded its approval to initiate the conduct of SWAYAM / NPTEL / MOOC courses, as identified, as PBOCs in Dept of Architecture and Dept of Planning as per modalities mentioned herein.</i>



Item # 17.8	Approval of 'Extra-Curricular Open-Audited (ECOC)' courses which are inter-disciplinary or extra-curricular in nature, for Dept of Architecture and Planning, as compulsory requirements
Proceedings	<p>It was apprised to all Senate members that, in order to students of SPAV may be given the option to take up certain courses which are inter-disciplinary and extra-curricular in nature, for giving a wider exposure towards development of soft skills, constructive creative habits, and life-skills. Courses in the domain of foreign languages, Sanskrit, physical education based courses like yoga, courses by NSS, NCC, performing arts, digital enablement, artistic expressions, may be taken up by students, as per their choice. Such courses shall be called 'Extra-Curricular Open-Audited (ECOC)' and may be taken up from any university, during vacations and holidays, without impacting the time-table of SPAV. In line with this, after detailed deliberations amongst Senate members, the modalities of taking up ECOC courses, is as concluded below:</p> <ol style="list-style-type: none">Extra-Curricular Open-Audited (ECOC) can be taken up from online platforms, local universities, from SPAV, or any university, and such courses can be inter-disciplinary or extra-curricular in nature.ECOC should be of minimum 08 hrs duration and the conductor of the course should issue an official completion certificate, at the end of the course.The ECOCs have to be taken without impacting the time-table of the Department at SPAV.Students have to declare their option of taking an ECOC course before the start of the semester through an application process and get it approved by HoD or ABoS.Such courses, upon successful completion, shall be reflected as Extra-Curricular Open-Audited (ECOC) in the credentials of the student and shall not be counted in the calculation of CGPA/SGPACompletion certificates of such Extra-Curricular Open-Audited (ECOC), shall be submitted by the Department to the Exam Section at the start of a semester for the courses taken prior to that semester, so that it can be acknowledged in the credentials of the student without counting such courses in the calculation of CGPA/SGPA.First year UG students to complete minimum one such course per semester for first 4 semesters.First year PG students to complete minimum one such course per semester for first 2 semesters.Upon completion of two semesters of ECOCs in both Departments and evaluating the success of the same, detailed modalities can be worked out by the Departments to integrate these courses into the credit system of the Institute with appropriate syllabus and grading strategy. <p>After detailed deliberations, the Senate decided as below:</p>
Decision	<i>The Senate considered, approved and recommended the initiative and accorded its approval to initiate the conduct of Extra-Curricular Open-Audited (ECOC), in Dept of Architecture and Dept of Planning as per initial modalities mentioned herein.</i>
Item # 17.9	Approval for extension of maximum duration of PhD candidate Ms. Mrunmayi D. in Dept of Planning, as a one-time measure
	It was apprised to all Senate members that, Ms. Mrunmayi D., (Reg. No. 2160300008) a registered PhD scholar of Dept of Planning, has in Jan 2024



Proceedings	<p>completed maximum permissible time duration of Six plus One years, i.e., what one can get as per the Academic Ordinances of SPAV applicable to her. But as her thesis was still not complete, the DRC Planning (on 10.01.2024) has recommended for a final extension of one more year for completing all the remaining academic requirements of her PhD thesis. The same was placed before the JCDRC of SPAV in 26.02.2024 which felt that as a one-time measure, without setting any precedence for future, and as recommended by DRC-Planning, the candidate may be given a maximum of one more year extension for completion of all requirements and submission of final PhD report.</p> <p>After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate accorded an approval and recommended extension of one year for PhD candidate Ms. Mrunmayi D. from the date of JCDRC minutes (26.02.2024), as a one-time measure, without setting any precedence for future.</i></p>
Item # 17.10	<p>Modification of Clause for Allotment of Main Supervisors for PhD</p>
Proceedings	<p>It was apprised to all Senate members that, the JCDRC of SPAV, in its last meeting, while finalizing the list of supervisors for the newly admitted PhD candidates of AY 2023-24, and while going through the recommendations of the Dept of Architecture, felt that SPAV may consider that - after the completion of PhD by an existing SPAV faculty, for up to one year, he/she can become only Co-Supervisor to any PhD candidates. Thereafter, after completion of one year, clause 7.2 and 7.3 of Academic Ordinance of PhD 2023 may be applicable to them and they may be considered for becoming Main Supervisor to any other new candidates. After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate accorded an approval and recommended modification of Clause 7.2 and 7.3 to the effect that - after the completion of PhD by an existing SPAV faculty, for up to one year, he/she can become only Co-Supervisor to any PhD candidates. Thereafter, after completion of one year they may be considered for becoming Main Supervisor to any other new candidates.</i></p>
Item # 17.11	<p>Endowment Fund for the Award of “Best Female Student of B.Planning”</p>
Proceedings	<p>It was apprised to all Senate members that, SPAV has received a letter addressed to Director SPAV, from Prof. Dr. N. Sridharan (Retd.), the former Director of SPA Vijayawada which is enclosed with a cheque of Rs 1,00,000/- requesting to start an Award of Best Female Student of B.Planning (with highest overall marks/grades for the degree). The letter is placed as Annexure XI. The award is to be termed as ‘Sugantha Award’ as per the letter and the awardee is proposed to receive a ‘medal’ and a ‘certificate’ from the endowment fund. After detailed deliberations, the Senate decided as below:</p>



Decision	<p><i>The Senate recommended for the initiation of the Award for Best Female Student of B.Planning (with highest overall marks/grades for the degree), which shall be awarded as a medal and certificate to be given during SPAV's Annual Day from the annual interest earned out of the Endowment Fund. The matter may be placed for approval in the FC and BoG of SPAV.</i></p> <p><i>The Senate recommended that the same may be followed for other endowment funds received in future where awards may be given in the form of a medal / certificate / cash prize / tuition scholarship etc., after taking due approval.</i></p>
Item # 17.12	Policy Regarding Student Exchange Programme with Foreign Universities – Ecole Bleue University, France
Proceedings	<p>HoD Architecture apprised all members along with Dean Academics that in order to operationalise the MoU between SPAV and the Ecole Bleue University France, several meeting took place online and offline between officials of both Universities. A roadmap has been worked out with Ecole Bleue for student exchange at UG level for the forthcoming Odd semester of AY 2024-25 for students of IV and V Year with a selection procedure by both the universities. The visiting V Year students shall undertake only the studio subject (12 credits) and the dissertation (06 credits) at Ecole Bleue between October 2024 -Mid January 2025 as part of the Exchange programme while completing the rest of the 12 credits of theory at SPAV. The courses taken at Ecole Bleue will be deemed as equivalent to Studio and Dissertation of SPAV. The visiting IV Year students shall complete the practical training in India any time between June and September 2024, and do an additional internship at Ecole Bleue, aimed at International Exposure and the credits earned at Ecole Bleue would be reflected in the marksheets as a Programme based Open-Audited course (PBOC). The call of interested students have been announced and 04 students have been selected from SPAV and their CV and portfolio has been forwarded to Ecole Bleue University. The process is underway. After detailed deliberations, the Senate decided as below:</p>
Decision	<p><i>The Senate considered, approved and recommended the process of student exchange initiated with Ecole Bleue University of France and encourages the Departments to initiate more such efforts and activities.</i></p>
Item # 17.13	Credit Exchange Elective Courses with SPA Delhi and SPA Bhopal
Proceedings	<p>It was apprised to all Senate members that, SPA Vijayawada, SPA Bhopal and SPA Delhi faculty can initiate academic collaboration as Phase I, in upcoming semester, by offering a few subjects as 'exchange elective subjects' to the PG students of their sister institution. Certain subjects offered in SPA Vijayawada shall be taught on a hybrid mode, and can be taken up by students of SPA Delhi / Bhopal at PG level as electives, and they can attend the lecture every week online. There can also be a provision where the SPA-D/SPA-B students can visit</p>



	SPAV for one of the week in the entire semester for offline class. The students of other SPAs would undertake assessments as devised by SPAV and would be evaluated in percentage on a scale of 100%. The percentage evaluation can then be submitted to other SPAs which can be equated by SPAD or SPAB within their own grading and CGPA equations. The same can apply for SPAV students who wishes to take up elective course from SPAD or SPAB. After detailed deliberations, the Senate decided as below:
Decision	<i>The Senate accords it approval to and recommended, the process of exchange of subjects as collaboration between the three SPAs and encourages the Departments to initiate more such efforts and activities with other universities.</i>
Item # 17.14	Revision of Remuneration/Honorarium of Jury members, Visiting Faculty, and External Experts for Special Lectures
Proceedings	It was apprised to all Senate members that, the remuneration rates for external experts who render services to SPAV as jury, special lecturers, etc. have been varying for different time durations, and has not been re-visited for over 5 years, are lower than many other CFTIs, and there does not exist any rate for experts who are foreigners/NRIs delivering online from abroad or on-site. Understanding that there is a scope of streamlining, an empowered committee was set up by the Competent Authority in 2023, which has studied the rates of several other institutes of repute from IIT, NIT, and other categories and submitted a report in Nov 2023. It was apprised that the increased expenses shall be met within the approved budget of the next Academic Year 2024-25, without any additional budgetary requirements. After deliberations, the Senate decided as below:
Decision	<i>The Senate considered, approved and recommended the Revised Rates of Remuneration/Honorarium to be effective from next Academic Year (as per Annexure VIII to this Minutes) for further approval of FC and BoG.</i>

ITEMS FOR RATIFICATION

Item # 17.15	Direct Admissions to Post Graduate and PhD Programmes and process as initiated for AY 2024-25
Proceedings	It was apprised to all Senate members that, as per the Academic Ordinance of SPAV 2023, SPAV has published Advertisement related to PG Direct Admissions as Notification in Newspapers and SPAV website on 06-03-2024. It has also published Advertisement related to Direct Admissions of PhD on 08-04-2024. All advertisements have been placed in national and regional newspapers with wide coverage. The process of Admissions through Direct Admissions, CCMT, JoSAA and DASA is underway for 2024-25 AY. The status update was presented to all members vide annexures of the Agenda Notes.
Decision	<i>The Senate noted and appreciated the efforts related to admissions.</i>





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Item # 17.16	Constitution of ABoS as per Academic Ordinance of 2023, who have been also authorized to undertake functions of DUGC and DPGC as per Academic Ordinance of 2019
Proceedings	<p>In line with the approved Academic Ordinance 2023, the ABoS has been constituted for both the Departments, and has been functioning since its formation after the start of Academic Ordinances of 2023. Since the earlier Ordinances of 2019 had several other committees like DUGC, SUGC, DPGC, SPGC, GMC, SRC, etc., in order to streamline the academic execution, for overcoming multiplicity of committees and overlaps and for a streamlined, approach of academic processing, it has been opined that:</p> <p>I. The Advisory Board of Studies – Planning, and Advisory Board of Studies – Architecture (along with duties prescribed in the Academic Ordinances of 2023), shall also render all the functions and duties of UG and PG related academic matters, as per regulations set forth in Academic Ordinance of 2019, for batches admitted prior to 2023 and after 2019. Therefore, the existing committees of DUGC, SUGC, DPGC, SPGC, and GMC as per old Ordinances shall cease to exist with the formation of the ABoS in each Department. While dealing with batches admitted prior to 2023 and after 2019, the ABoS shall apply the regulations of 2019 to the concerned batches and render the services of all academic matters related to UG and PG, and perform the duties of DUGC, SUGC, DPGC, SPGC, etc.</p> <p>II. The DRC for each Department, (along with duties prescribed in the Academic Ordinances of 2023) shall also render all the functions and duties of PhD related academic matters for batches admitted prior to 2023 and after 2019, in lieu of DPGC and SPGC, without overruling the functions of SRCs. Therefore, the roles existing committees of DPGC, SPGC as per old Ordinances regarding PhD shall cease to exist with the formation of the DRC in each Department. The DRC shall apply the regulations of 2019 to the concerned batches and render the services of all academic matters related to PhD, and perform the duties of DPGC, and SPGC, wherever applicable.</p> <p>III. The existing SRC committees for individual PhD scholars admitted between 2019 and 2023 shall continue to exist owing to presence of external members in each of the said SRC Committees and to the work already executed monitored by the SRCs. The decisions of SRCs shall be forwarded to the Exam and Academic Section through the respective DRCs after conduct of every SRC.</p> <p>After deliberations, the Senate decided as below:</p>
Decision	<i>The Senate accorded it ratification to ABoS's and DRC's additional functions as DUGC, DPGC, etc. till the batches adhering to Ordinances of 2019 passes out.</i>

ANY OTHER ITEMS

Item # 17.15	Engagement of Adjunct / Emeritus / Visiting Professor at the Department of Architecture and Planning
Proceedings	It was apprised to all Senate members that, in the Third Meeting of Senate of SPA Vijayawada held on Dec 05, 2017, under Item 3.9(a), the guidelines and terms and conditions for appointment of Emeritus / Adjunct / Visiting Professor in SPA Vijayawada was approved. Thereafter, in the 25 th Meeting of BoG of SPAV held on 27.04.2018, as part of Action Taken Report, the Board Chair gave the decision of approval of two candidates selected as Emeritus Professor and



	<p>Visiting Professor, as per the terms and conditions of selection process followed by SPAV.</p> <p>Thereafter, in the 26th Meeting of BoG of SPAV held on 14.12.2018, the BoG suggested to re-advertise once again as the selected Professor has not joined.</p> <p>In view of the above, it was apprised to all Senate members that, SPAV is in the course to initiating the process of re-advertising and selecting certain candidates as Adjunct / Emeritus / Visiting Professor at the Department of Architecture and Planning.</p>
Decision	<p><i>The Senate noted and recommended to initiate the process of re-advertising and selecting Adjunct / Emeritus / Visiting Professor at the Department of Architecture and Planning, with due approval of FC and BoG.</i></p>

The Chairperson thanked all members for their valuable suggestions and requested all the external experts to visit the campus in the next Senate meeting to experience the state-of-the-art laboratories, classrooms, studios, library and encourage the faculty and students in their academic pursuits.

With no other item for discussion, The Registrar, extended a vote of thanks and announced the closure of the meeting.

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निदेशक / Director 03/6/24
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An Institute of National Importance, Ministry of Education Gov. of India

ANNEXURES **(to the Minutes)**

For the
17th Meeting of the Senate

held on

May 27th 2024, 11:00Hrs.

at

SPAV Campus

Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Master of Planning (Environmental Planning and Management)

Course Structure and Detailed Syllabus for
Two Year Masters Degree Programme in Planning

Effective from the Academic Year 2024-25 onwards

(As Approved by the Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाड़ा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, Ministry of Education, Govt. of India

Introduction to Master of Planning (Environmental Planning and Management)

Master of Planning (Environmental Planning & Management), abbreviated as M.Plan (EPM), is a two-year full-time PG programme in Planning offered by the School of Planning and Architecture, Vijayawada specialising in Environmental Planning and Management.

The overall aim of the programme is to rationally sensitise the students towards the intricate ecological relationship between nature and human settlements and thereby equip them with adequate skills required to comprehend, analyse and plan for urban and regional issues with the pretext of maintaining ecological balance. This broad aim intrinsically shall involve comprehension of physical, socio-economic, cultural, political and ecological dimensions of the human settlements. It shall focus particularly in recording and interpreting environmental resource baseline and their local and regional capacities to deal with human needs. The course structure and syllabus are designed with coherence and reference to the Model Curriculum for Master of Planning by the All India Council for Technical Education (AICTE) 2020 and Model Curriculum for Master of Planning by ITPI, Orienting Planning Education in Line with NEP 2020. The curriculum integrates a variety of subjects, including studios, labs, theory, and field visits. The broad course structure of the programme is as follows:

The **first semester** is an integrated semester common to all master courses of planning offered by the school. The studio focuses on area planning. Subjects offered are introduction to planning theories and concepts, data analytics and techniques in planning, habitat and environmental planning, infrastructure planning, and socio-economic dimensions in planning.

The **second semester** is aimed to inculcate the core specialised competencies of environmental planning in terms of theories and tools like use of environmental monitoring lab, theory of environmental planning, ecological footprint analysis, environmental economics, waste water treatment, planning for healthy cities, etc. The studio aims to take up a small or medium town with development challenges and local/urban environmental issues. It offers two electives, out of which students are expected to select one.

The **third semester** focuses on regional environmental planning issues and imparts advanced level theory courses like EIA techniques, energy studies, and environmental law and professional practise. This semester also introduces project planning and management tools and focuses on waste management and climate change as electives. The students are expected to develop their thesis ideas in the semester through the advanced research methodology course.

The **fourth semester** requires the student to undertake thesis/terminal project with an emphasis on academic or applied research. In addition, two theory subjects are offered on environmental justice, and environmental policy and governance.

There are eight electives (including professional electives) and eight audit courses offered in the second and third semesters in total in MEPM. Each subject is divided into five sections consisting of the subject details, objective, units and suggested readings. The subject syllabus is broken into progressive sections through the units, to be taught over the semester. However, it may be noted that the syllabus covered is not exhaustive and the individual subject teacher may augment the syllabus as per his/her perception of the subject with prior concurrence of the Head of the Department.

The subject faculty members are encouraged to assess the students in a progressive manner throughout the semester through seminars, debates, group/individual presentations, term papers, written exams (open or closed book), take home exams, report submissions, viva voce, etc.

The five underlying principles of 'Sustainability, Equity, Efficiency, Harmony, and Safety' are to be emphasized as a cross-cutting theme in executing planning lab/studio exercises and application of theory subjects. The syllabus also introduces concepts of Indigenous Knowledge Systems (IKS) in Environmental Planning and Management. The syllabus is designed so as to develop strong communication, interpersonal, advocacy and analytical skills of the student. The course endeavours to give real time experience to students through their involvement in the ongoing or live projects. The programme is designed to enable the growth of the students into professionals in the field, who are not only environmentally sensitive in their planning approaches but are versed with the know-how of the state-of-the-art techniques in the industry.

FIRST SEMESTER (INTEGRATED)

S. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MPIS111	Area Planning Studio	3	0	12	15	15	SC
2	MPIS112	Planning Theories and Concepts	2	1	0	3	3	TC
3	MPIS113	Data Analytics and Techniques in Planning	2	1	0	3	3	TC
4	MPIS114	Habitat and Environment Planning	2	1	0	3	3	TC
5	MPIS115	Infrastructure Planning	2	1	0	3	3	TC
6	MPIS116	Socio-Economic Dimensions in Planning	2	1	0	3	3	TC
TOTAL			13	5	12	30	30	

SECOND SEMESTER

S. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MEPM121	Urban Environmental Planning Studio	3	0	12	15	15	SC
2	MEPM122	Geo-informatics & Analytics in Planning	1	1	1	3	3	JC
3	MEPM123	Environmental Monitoring & Assessment Tools	1	1	1	3	3	JC
4	MEPM124	Theory of Environmental Planning & Design	2	1	0	3	3	TC
5	MEPM125	Environmental Economics	2	1	0	3	3	TC
Elective 1: ANY ONE								
6	MEPM1210	Ecological Footprint and Carrying Capacity	2	1	0	3	3	OE
7	MEPM1211	Water-centric Planning & Management	2	1	0	3	3	OE
8	MEPM1212	Planning for Healthy Cities	2	1	0	3	3	OE
9	MEPM1213	Planning for Resilient Infrastructure	2	1	0	3	3	PE
10	MEPM1214	From other Master programmes (same semester) / online platform duly approved the department	2	1	0	3	3	OE
TOTAL			12	5	13	30	30	
ECOC Audit Courses: ANY ONE								
11	ECOC1	To be Chosen						A
12	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
13	PBOC1	To be Chosen						A
14	PBOC2	To be Chosen						A

Note 1: Compulsory Summer Professional training / internship (of six weeks) after second semester is to be undertaken by each student. The compulsory training shall be deemed as completed only when the Department of Planning examines the work of each student in the subsequent third semester and declares it to be "Satisfactorily Completed".

THIRD SEMESTER

S. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MEPM211	Regional Environmental Planning Studio	3	0	12	15	15	SC
2	MPIS212	Research Methods	2	1	0	3	3	JC
3	MEPM213	Environmental Impact Assessment Techniques	2	1	0	3	3	TC
4	MEPM214	Project Planning & Management	2	1	0	3	3	TC
5	MEPM215	Energy Studies in Planning	2	1	0	3	3	TC
Elective 2: ANY ONE								
6	MEPM2110	Human Settlements and Climate Change	2	1	0	3	3	OE
7	MEPM2111	Integrated Waste Management	2	1	0	3	3	PE
8	MEPM2112	Environmental Data Analytics	2	1	0	3	3	PE
9	MEPM2113	From other Masters programme (same semester)/ online platform duly approved the department	2	1	0	3	3	OE
10	MEPM2114/ MURP215	Disaster Preparedness and Management	2	1	0	3	3	OE
TOTAL			13	5	12	30	30	
ECOC Audit Courses: ANY ONE								
11	ECOC1	To be Chosen						A
12	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
13	PBOC1	To be Chosen						A
14	PBOC2	To be Chosen						A

FOURTH SEMESTER

S. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MEPM221	Environmental Planning Thesis	2	0	22	24	24	JC
2	MEPM222	Environmental Justice and Professional Practice	2	1	0	3	3	TC
3	MEPM223	Environmental Law, Policy and Governance	2	1	0	3	3	TC
TOTAL			6	2	22	30	30	

Note 2: Credits for each subject are the same as the number of lecture / practical hours per week, whichever is higher.

Subject Code Nomenclature:

MPIS111 is to be read as:

MPIS = Masters in Planning (Integrated Sem);

1 (2nd digit) = 1stSem of 1st Year;

1 (1st digit) = 1st Year;

1 (3rd digit) = 1st Subject.

MEPM211 is to be read as:

MEPM = Masters in Environmental Planning;

1 (2nd digit) = 1stSem of 2nd Year;

2 (1st digit) = 2nd Year;

1 (3rd digit) = 1st Subject.

MEPM2110 is to be read as:

MEPM = Masters in Environmental Planning;

1 (2nd digit) = 1stSem of 2nd Year;

2 (1st digit) = 2nd Year;

10 (3&4th digit) = 1st Elective Subject.

Subject Category Nomenclature:

SC = Studio Core Subject

TC = Theory Core Subject

JC = Jury Core Subject

PE = Professional Electives

A = Audit Subjects

OE = Electives from Other Masters
Programme (Same Semester)/online
platform duly approved the department

SC (Studio Core Subject): These subjects are the practical backbone of the curriculum, focusing on hands-on projects and real-world applications, essential for mastering planning skills.

TC (Theory Core Subject): These subjects provide the theoretical foundation, covering key concepts, methodologies, and frameworks necessary for understanding urban and regional planning.

JC (Jury Core Subject): These subjects involve assessments and presentations, where students present their projects and designs before external experts at the end of the semester, fostering evaluation and feedback.

PE (Professional Electives): These subjects focus on advanced professional skills and knowledge, preparing students for specific career paths within the planning industry.

OE (Electives from Other Masters Programme - Same Semester): These subjects provide an interdisciplinary approach by allowing students to take courses from other master's programs, broadening their academic perspective.

ECOC and PBOC are the open electives that are non-graded courses.

**Detailed Syllabus
for

Master of Planning
(Environmental Planning and Management)**

MPIS111- Area Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objective:

- To enable the students to understand the socio-economic and spatio-cultural, environmental characteristics along with the land-use dynamics of the study area.
- To plan for rational physical and socio-economic interventions for sustainable and harmonious development of the future.

Part A:

Literature and Documentary Review on the selected themes **15**

Area Appreciation at the sub-city level **30**

Understanding the linkages between different aspects of socio-economic life in relation to the land-use in the cities. Preparation of area profiles in the city, such as residential, commercial, recreational, industrial, slum area and institutional area. Studying impact of land use, economic and socio-cultural activities on the physical environment of the area.

Part B: Village Planning **60**

Preparation of plans for the identified village/s by studying the physical, socio-cultural, economic, environmental and governance aspects. Understanding how development impacts villages and the communities. Appreciating the need for balancing development with sustaining the livelihoods of rural communities and drawing plans for suggested interventions for the community. Community Engagement and Integrating Indian Knowledge System (One week field visit including community engagement).

Part C : Local Area Planning/ Area Development Planning **120**

Preparation of neighbourhood plan considering different user groups. This may involve the preparation of local area plans/ area development plans/ residential / site plans (low and high density) preferably for areas where new developments are coming up.

Students need to understand the need for a balanced development with incorporation of elements like sustainability, livelihood, environmental protection, inclusive growth and institutional engagement. In addition, emphasis will be given on planning terminologies, strengthening the planning vocabulary and technical communication skills.

Total: 225 Period

Outcomes:

- Basic knowledge and skillset to prepare the grassroots level plans
- Capability to prepare neighbourhood plans by integrating the sectoral needs
- Students' skills in area appreciation and mapping techniques

References:

1. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Vol. 1, Ministry of Urban Development, New Delhi.
2. Manitoba Intergovernmental Affairs and City of Winnipeg's Planning, Property and Development Department – Planning and Land Use Division (2002), A Guide for Developing Neighbourhood Plan.
3. Thomas Russ. R(2009), Site Planning and Design Handbook. McGraw Hill Publications.
4. Singh. K (2009), Rural Development Principles, Policies and Management. Sage Publications, Pvt. Ltd, New Delhi.
5. Gram Panchayat Spatial Development Plans as developed under the guidelines of MoPR, GoI

MPIS112 - Planning Theories and Concepts	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To equip the students with the required knowledge of conventional and contemporary planning thought, pluralistic nature of values in the profession, planning approaches and models. Focus would be on integrating procedural and substantive elements of planning theory to current and future planning practices.

Unit I Planning Concepts

9

Settlement systems, Classification of settlements, primate city, central place concept, concepts of complementary area, central goods and services, range, threshold etc; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; push and pull factors; migration; need for planning; Scalar arrangements in Planning (regional, mega, metro regions, city and local area plans).

Unit II Rational Planning Approaches and Models

9

Systems approach to planning; Comprehensive development plan; Pluralism in planning; Strategic planning; Structure plans; Incremental planning; Equity based planning; Inclusive planning; Participatory planning – Collaborative and communicative planning; Introduction to Political economy model, New economic geography models & globalisation models.

Unit III Techniques of Plan Preparation

9

Surveys, Techniques of conducting surveys for land use, building use, density, structural condition of buildings, heights of building, land utilization and physical features of land; Techniques of mapping – methodologies, physical surveys, land use classification, base map preparation for various levels of plans; Choice of appropriate scales for various types of plans; Data requirement for various types of plans; Planning standards and regulations – Spatial standards, performance standards and standards for utilities, URDPFI guidelines, development control regulations.

Unit IV Methods and Tools

9

Analytical methods - linear programming, threshold analysis, simulation, rank size rule, scalogram, sociogram, cluster and factor analysis, delineation techniques, SWOT analysis; location models, gravity models.

Unit V Emerging and Future Trends

9

Emerging school of thoughts and doctrines; Recent and contemporary contributions to the changing planning paradigms; Planning for future and in future - vision development, strategizing, Implementation of planning policies and development plans.

Total: 45 Periods

Outcomes:

- Application of relevant planning theories and concepts in urban and regional planning

References:

1. C S Bertuglia, G. Leonardi, (eds) (2018). Urban Systems: Contemporary Approaches to Modelling. Routledge, London.
2. Richard E. Klosterman, Kerry Brooks, Joshua Drucker, Edward Feser, Henry Renski (2018). Planning Support Methods: Urban and Regional Analysis and Projection. Rowman & Littlefield Publishers.
3. Wang, Xinhao & Hofe, Rainer (2007). Research Methods in Urban and Regional Planning. Springer-Verlag Berlin Heidelberg. Tsinghua University Press.
4. Philip Allmendinger (2017). Planning Theory. Macmillan Education Publications.

MPIS113 - Data Analytics and Techniques in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To acquire proficiency in statistical techniques and able to conduct empirical studies employing statistical software

Unit I Data sources and surveys in Planning 9

Types of data, data aggregation, units of measurement, standard notation; coding and decoding methods, tabulation and graphical presentation of data; Introducing web-based information portals and datasets as raw information sources; Elementary association models and decision making; Index Numbers (weighted and unweighted); Application of index number in spatial planning; Calculation techniques of vital events; Quantitative and qualitative data collection methods; Validity and reliability of data; Questionnaire design and typology; measurement scales and their applications; Sampling techniques, sample size calculations.

Unit II Introduction to Statistical Methods for planning 9

Descriptive statistics (Frequency distribution; Measures of central tendency; Measures of dispersion); Introduction to probability; normal and standard normal distribution; Tests of hypothesis- type I & II errors, one-tailed and two tailed tests, chi-square test, student T test.

Unit III Correlation and Regression 9

Correlation – scatter plot diagrams, correlation coefficients; Least square method; Assumptions of regression analysis, linear regression, multiple regressions; Dummy variables; Functional forms; Binary dependent variables; Instrument variables; Time series analysis;

Unit IV Spatial Data and Geographic Information Systems 9

Definitions – Geoinformatics, Remote Sensing, Geographic Information Systems (GIS), the concept of earth surface projections; the need for GIS, Spatial Data Infrastructure; accuracy and precision, raster and vector data, spatial thematic models, Components of a GIS; spatial and attribute data- input and output; spatial data entry- data structure for GIS, vector data structures; Coordinate systems; Geodetic data - point positioning, problems, measurements, spatial analysis using lab modules, etc.

Unit V Planning Techniques 9

Maps as a representation of reality, Elements of Maps; Graphical, linear and areal scales, Notations involving basic discipline of maps; Measurement of areas; Data creation and query; Map preparation – Geo-referencing, digitization, scales, layers, layout, topology creation, spatial data analysis - buffer, overlay and multi criteria decision modelling, Hotspot analysis.

Note: Examples from spatial planning to be applied in each unit using softwares like QGIS, ArcGIS, Geoda, Spreadsheets, SPSS, etc.

Total: 45 Periods

Outcomes:

- Proficiency in using statistical and planning techniques in urban and regional planning

References:

1. Agarwal B L (2007), Programmed Statistics. New Age International Publishers, New Delhi.
2. Alan C. Acock (2012), A Gentle Introduction to STATA. Revised Third Edition.
3. Gupta and Gupta (2012), Business Statistics. Sultan Chand and Sons, Delhi.
4. Wooldridge (2011), Introductory Econometrics: A Modern Approach. Thomson Press, Noida.
5. Gujarati, D.N. and Porter, D.C., 2009. *Basic econometrics*. McGraw-hill.
6. Sachithanandan (2004), Reading material on Planning Techniques, Institute of Town Planners India, New Delhi.

MPIS114 - Habitat and Environmental Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To give insights on global and local issues of environmental concern and introduce fundamental concepts and policies related to housing.

Unit I Components of Nature and Ecology 9

Meaning and components of nature; Basic concepts of ecology, process of flow of material, water, energy, invasion, succession, perdition, regulatory forces, adaptation, tropic levels, food chains, food web, ecological pyramids; Ecology and their relevance to planning; Modifications in natural environment, causes and consequences.

Unit II Global & Local Concerns for Environment 9

Evolution of human settlements; Civilizations and impact on environment; Contemporary environmental discourse; Green agenda and brown agenda; Global environmental movement; Environment and poverty; Environmental management and environmental planning; Global warming, climate change; Biological diversity; Brunt land's Commission's Report; Agenda 21; Club of Rome Report; UNEP charters.

Unit III Environmental Resources: Consumption, Conservation and Recycling 9

Environmental resources and ecosystem services; Concepts of natural reserves; Consumption, conservation and recycling of resources; India's environmental programmes; Government of India's policies relating to forest, wildlife, hill, water resources, wastelands, hills, coastlines, oceans, etc.; local climatic zones; vulnerability analysis; Climate Smart Cities and Sustainable Framework.

Unit IV Housing and Built Environment 9

Significance of housing in national development goals; Housing as a basic entitlement - core issues of housing, factors affecting residential location, theoretical knowledge of ecological, neo-classical, institutional approach to housing; estimating housing shortage, housing need, current methods of demand assessment, typologies of housing, housing norms; Densities and standards; Urban sprawl and environmental damages; Gender based planning of neighbourhoods and human settlements.

Unit V Housing Sectors, Acts and Policies 9

Affordable Housing; Housing for the low-income groups – slums and squatter settlements, investment in housing in public and private sectors; Cooperative housing, objectives and principles, management and financing of housing projects; Acts, policies and programmes; Comparative policy analysis.

Total: 45 Periods

Outcomes:

- Understanding of the housing issues and environmental concerns in settlement planning

References:

1. Thomas L. Daniels (2014). The Environmental Planning Handbook for Sustainable Communities and Regions. Planners Press, American Planning Association.
2. Jetske A. Bouma, Pieter J. H. van Beukering (2015). Ecosystem Services: From Concept to Practice. Cambridge University Press.
3. Van Bortel, Gerard, Vincent Gruis, Joost Nieuwenhuijzen & Ben Pluijmers, (Ed.) (2018), Affordable Housing Governance and Finance: Innovations, partnerships and comparative perspectives. Routledge, London.
4. Nicholas Dagen Bloom, Lawrence Vale (2015). Public Housing Myths: Perception, Reality, and Social Policy. Cornell University Press.

MPIS115 - Infrastructure Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To develop skill sets pertaining to provision of physical and social infrastructure services in urban and regional planning.

Unit I Introduction to Infrastructure Planning

9

Importance of infrastructure, objectives of the utilities, services planning and implications on public health and environment; Role of physical planner in planning of utilities and services; Role of line agencies in municipal areas; jurisdiction and scope of work of line agencies; Resilient Infrastructure, Smart cities and its infrastructure.

Unit II Physical Infrastructure

9

Water and Waste Water Scheme, Layouts of distribution system; IUWM, Water and Waste water treatment methods, Low-cost sanitation methods and storm water drains; Zero discharge systems; Integrated Solid Waste Management; MSWM 2000. Environmental Policy 2006; Urban Energy Systems and Civic services. Service Level Benchmarks.

Unit III Social and Economic Infrastructure

9

Types of social infrastructure; Health care - essential service, availability, access and utilisation, standards, public and private institutions, policies, National Rural Healthcare Mission, hierarchy of health care establishments; Education - primary and secondary educational institutions, standards, policies, right to education (RTE); Public and community spaces – recreational, safety and security; Distributional services, Economic Infrastructure.

Unit IV Transportation and Land use Integration

9

Introduction to transport and travel; Understanding travel from the mobility, economic, social-psychologist, time/space perspective; Factors affecting land use-transport integration, and tools for land use and transport integration, land use transport cycle, importance of accessibility, Transportation planning process; Introduction to four stage modelling; Demand and supply of transport; Congestion pricing; Transport Pricing, Basic transport economic model; SLBs; Introduction to carbon footprint.

Unit V Formulation of DPR for Infrastructure Services

9

DPR and its importance; contents of DPR; broad sequences to DPR formulation; capabilities required to prepare a DPR; DPR evaluation, Project Cost, Institution Framework, Project Financial Structuring, Project Phasing, Project O&M planning, Project Financial Viability & Sustainability.

Total: 45 Periods

Outcome:

Knowledge and skillsets on planning for infrastructure services at urban, rural and regional level.

References:

1. Dinesh M, Omer T, Michael S, Michael J, (2009), Road safety in India: challenges and opportunities. University of Michigan, Transport Research Institute.
2. Government of India, (2010), Service level benchmarks for urban transport. Ministry of Urban Development. http://urbanindia.nic.in/programme/ut/Service_level.pdf
3. Jaun de Dios Ortuzar, Luis G. Willumsen, Wiley, (2011), Modelling Transport (4th Edition), Routledge.
4. Jean-Paul Rorigue, Claude Comtois, Brian Slack, (2006), The geography of transport systems. Routledge.

MPIS116 - Socio-Economic Dimensions in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To provide an understanding of the society and the economy of the nation and its importance in spatial planning.

Unit I Introduction to Sociology

9

Definition and scope of sociology; Concepts-society, social systems, social structure, institution and organisation; Understanding society- theories and methods; Sociology and planning, Planning and Sociology; Man – Environment relations and traditional spatial planning practices; Need for Demographic studies.

Unit II Social Groups, Social Issues, Rural and Urban Sociology

9

Social groups, social stratification, social exclusion and social inclusion; Agrarian, industrial and modern society and spatial formation; Linking social structure and physical structure of village and urban settlements; Sociology of formal and informal settlements in cities and towns; sustainable society and liveable neighbourhoods; making of smart homes, communities and neighbourhoods.

Unit III Demography and Planning

9

Traditional and modern theories of population, population dynamics, Population patterns in India and the World; Distribution & structure of population, Population change causes & implications, demographic characteristics of population and their measures, population growth and development, natural growth and migration of population. Basics of population studies, source of demographic data, population structure and composition – age sex composition, sex ratio, dependency ratio, child-woman ratio; Measures of age–sex structure, age–sex pyramid. population projections, cohort analysis;

Unit IV Applied Economics

9

Definition of economics - fundamental economic principles and concepts related to urban and regional planning; Basics of macro, meso and microeconomics, law of demand and supply- its relevance in planning; Goods, Market, factors of production; Economic concepts of land; Economic rent, land values, market mechanism and land use pattern. Employment mobility and analysis of distribution vis-a-vis place of residence; Economic base theory and techniques; economic development and growth indicators; economic growth vs development.

Unit V Socio-Economic aspects of Physical Planning

9

Social mix and Urban neighbourhood Planning, communities and neighbourhoods, employment, housing and land use transformation; Urban rich, middle and poor and socio-spatial mobility; Children youth, women, aged and differently abled people and spatial planning; Social and economic Auditing and Social and economic Impact Assessment and urban development. Disaster, Resilience, climate change and socio-economic relevance of physical planning.

Total: 45 Periods

Outcome:

- Exposure to concepts, theory and issues relating to socio-economic aspects in urban and regional planning

References:

1. Benjamin S (2008), Occupancy Urbanism: Radicalizing Politics and Economy beyond Policy and Programs, International Journal of Urban and Regional Research, Vol. 32.3, September, 719-729.
2. Brenner N and Theodor N (2002), Cities and Geographies of “Actually Existing Neoliberalism”, Antipode, Vol. 34, Issue 3, 349-379.
3. De Souza M (2010), Which Right to Which City? In Defense of Political- Strategic Clarity. Interface, Vol. 2(1), May, 315-333.
4. Jan L, Christopher M. (2012), The Urban Sociology Reader. Routledge, London.

SECOND SEMESTER

MEPM121 Urban Environmental Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	0
	Studio/Lab/Workshop/Practical	12
	Total Periods per Week	15

Objective:

To initiate planning skills through hands-on exercises of planning and to develop environmental planning perspective at urban/ city/ Town/Sub-City level.

Part A Introduction to Environmental Baseline Studies and Assessment 45

Detailed environmental studies to establish baseline of different components of environment at the town level, cause-effects and analysis of key environmental issues; Transformation of environmental conditions; Transformation of physical and socio-economic conditions; Relating physical growth and development aspects with changing environmental conditions; assessing the native characters and application of the indigenous knowledge systems, Review of Case studies, Plan Assessment.

Part B Development Planning for Environmental Management at a Town/Sub-City level 180

Detailed assessment of environmental status (all components) through primary and secondary surveys, Identification of Sources, Levels of Issues and Problem Analysis. Students to be taken to a live case area/town to undertake the exercise culminating in the preparation of Environmental Improvement Plan / Conservation Plan / Management Plan/ Risk Informed – Master Plan / Resilient Plan/ Environmental Regulations; Case studies/projects from towns/cities having/ located along coastline, ecologically sensitive areas, hill terrains, forest areas, deserts, delta regions, hazard-prone regions etc. to be preferred.

Note:

1) *Management and implementation of proposals are to be emphasised at every level of strategisation. To bring a holistic and pragmatic dimension to the Masters course, five core underlying parameters of a) Sustainability, b) Equity, c) Efficiency, d) Harmony, and e) Safety, are to be incorporated in the instruction strategies through case studies and examples, wherever applicable.*

2) *There need to be focus on identifying and analysing environmental concerns in the studio exercise.*

Total: 225 Periods

Outcome:

Acquiring skill-sets and knowledge that help understand and integrate environmental components and concerns into spatial planning to prepare management/ conservation/ improvement plans at urban level.

Suggested Readings:

1. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines*. Vol. 1, Ministry of Urban Development, New Delhi.
2. Honachefsky W B., (2000), *Ecologically Based Municipal Land Use Planning*. Lewis Publishers, London.
3. Ministry of Urban Development (2012), *Handbook of Service Level Benchmarks*. Govt of India. Delhi.
4. Randolph, J. (2012), *Environmental Land Use Planning & Management*. Island Press, Washigton.

MEPM122 Geomatics and Analytics in Planning	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	1
	Total Periods per Week	3

Objective:

Introduce the fundamental concepts of geo-informatics, the associated scientific tools, and their relevance and applicability in environmental planning.

Unit I Basic Spatial Statistics

9

Data exploration and spatial statistics for urban areas, evaluation, description and representation of spatial data quality, effect of inaccuracy on spatial data analysis. effect of data aggregation and disaggregation, MAUP (Modifiable Areal Unit Problem), Integration of spatial data of different quality Map matching. 3D volumetric analysis and modelling; Condition assessment of specific areas, Quantitative measurement of landscape surfaces; Vulnerability mapping and Monitoring.

Unit II Advance statistics

9

Point pattern analysis: Point Sets and Distance Statistics, Nearest neighbour methods Hotspot and cluster analysis; Spatial autocorrelation and Spatial regression for urban phenomena; multi-criteria decision-making tools, land suitability analysis, Factor analysis; Cluster analysis.

Unit III Raster and Vector Data Processing

9

Data Sources; Raster Calculation; Indices (NDVI, NDBI, NDWI, LST etc.); Supervised and Un-supervised Image Classification; Proximity Analysis; Interpolation; Density analysis; Terrain Analysis; slope and aspect calculation, hill Shade analysis, view shed Analysis.

Unit IV Application of GIS in Natural Resource Management

9

Resource Assessment; Land use Land Cover Change Detection; Wetland mapping; Agricultural Resource development mapping; Mapping of forest; Forest and wild life habitat Assessment; Mapping Surface Hydrology; Energy Resource Management; Risk and Hazard Mapping and modelling (landslide, floods, Cyclones Forest fire and drought).

Unit V Applications of GIS in Urban Areas

9

Multi-criteria decision-making using Land Suitability, Urban Growth Model, Multi-Hazard Mapping. Geographically weighted regression.

Total: 45 Periods

Outcome:

- Knowledge and skill set on application of geo-spatial techniques and related software in environmental planning.

Suggested Readings:

1. David J. M, Micheal F G and David W R (1991), (Eds.), *Geographical Information Systems – Principles and Applications. Volume I & II*. John Wiley Sons. Inc., New York.
2. Lilles and Keifer (2004), *Remote Sensing and Image Interpretation*. John Wiley and Sons, New York.
3. Singh R.B. (1992), *Environmental Monitoring: Applications of Remote Sensing and GIS*. Geocartha International Centre, Hong Kong.
4. William K.P. (2001), *Digital Image Processing*. John Wiley & Sons, New York.
5. Anil K.Jamwal (2008), *Remote Sensing and GIS*, JnanadaPrakashan, Delhi.
6. Cambell, J.B. (2002), *Introduction to Remote Sensing*, Taylor & Francis, London.
7. Jan Van Sickle (2010), *Basic GIS Coordinates*, Second Edition, CRC Press; 2 Edition, NY.
8. Richards, J.A. and Xia, X. (2006), *Remote Sensing Digital Image Analysis: An Introduction*, Birkhauser, London.

MEPM123 Environmental Monitoring & Assessment Tools	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	1
	Total Periods per Week	3

Objective:

Familiarisation of relevant instruments/equipment and procedures related to checking of quality of air, water and soil.

Unit I Water Quality: Physical Parameters 9

Determination of Physical Parameters of Water: Understanding of relevant instruments/equipment and procedures for determination of; Colour, Temperature, Turbidity, Odour, pH, Acidity, Alkalinity, Electrical Conductivity (E.C), Total Solids (TS), Total Dissolved Solids (TDS), Total Hardness.

Unit II Water Quality: Chemical and Biological Parameters 9

Determination of Biological parameters; Dissolved Oxygen (D.O), Biological Oxygen Demand (BOD), and Chemical Oxygen Demand (COD); Determination of Chemical Parameters Nitrates, Phosphates, Sulphates, Chlorides, Fluorides, Potassium and Sodium; Heavy metals) such as Lead, Copper, Nickel, Iron, Chromium etc.

Unit III Soil Quality and Weather Parameters 9

Soil quality - pH, EC, soil moisture, Phosphate, Potassium, Sodium, etc.
Weather - temperature, relative humidity, rainfall, wind direction and speed, etc.

Unit IV Air Quality and Noise Quality 9

Airshed Mapping, Measuring Air Quality Parameters (CO₂, CO, TSPM, RSPM, SO₂, NO_x) Air Quality Index, Air Pollution Modelling: Point Source, Line Source, Area Source; Noise standards and limit values, Noise Instrumentation and Mapping

Unit V Environment Modelling 9

Identifying Problem Statement at select scale, Modelling Prerequisites, Model Domain Setting, Instrument Placement, Scenario Building, Simulation Parameters and conditions, Evaluation and Interpretation - The course may prefer to select a particular sector/issue or topic within the fields of environmental planning and conduct limited research on the same. The outcome shall be a short research paper (about 10 pages) or a presentation

Note:

The modelling may be carried out at local scale like Bus Terminals, Highway Stretches, Parks and Open Spaces etc

Total: 45 Periods

Outcome:

- Knowledge and skill-set on understanding available environmental quality standards and their relevance and usage in spatial planning.

Suggested Readings:

1. Boubel, R.W. (2005), Fox, D.L., Turner, D.B., Stern, A.C., "Fundamentals of Air Pollution", Academic Press.
2. C. S. Rao (2000) "Environmental Pollution Control Engineering", Wiley Eastern Limited.
3. S.M. Khopkar, Environmental Pollution Analysis, New Age International Publications.
4. Trivedi P. R. (2012), *Environmental Pollution and Control*. APH Publishing Corporation, N Delhi.

MEPM124 -Theory of Environmental Planning and Design	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce detailed understanding of theories relating to environmental planning approaches and paradigms.

Unit I Historical Approach to Environmental Concerns 9

Development of habitat patterns and dependence on natural resources; Earliest forms of environmental concerns; Evolution of environmentalism; Characteristics and differences of urban environment and rural environment.

Unit II Growth of Environmentalism 9

Club of Rome report; Tragedy of Freedom of Commons; Environmental determinism concepts; Industrial Ecology concepts; Ecological modernisation concepts, ecology concepts; environmental lessons from the developed economies; Bruntland Report, Green and Brown Agenda environmental problems; NIMBY concepts, Ecosystem Approach.

Unit III Land Capability and Resource Depletion Analysis 9

Land as a threat and resource; Land capability analysis within the ecological context; Multi criteria decision analysis for planned transformation of land; Exploitation, causative factors for environmental and land degradation; Planning for various geographies - Hill area Planning; Planning for coastal areas; planning for islands; planning in deltaic zones; Eco-sensitive area planning etc.

Unit IV Environmental Management 9

Role of economic deterioration vis-à-vis environmental degradation; Watershed Planning and Management; Ground Water Management; Forest Resource Management; Biodiversity Conservation and Management; Managing environmental concerns through industrial and scientific innovation, traditional and indigenous coping techniques to environmental hazards; Ecological planning tools and techniques.

Unit V Design as a Determinant of Ensuring Environmental quality 9

Evolution of Environmental design for urban and regional context; Crime Prevention through environmental design; Rising material consumption; Zoning of environmentally sensitive areas; Design with nature; Energy efficiency in urban planning; climate-sensitive urban planning - components of Urban climatology, urban heat island and district cooling systems.

Total: 45 Periods

Outcome:

- Knowledge on theories relating to environmental planning approaches and paradigms.

Suggested Readings:

1. Honachefsky W B. (2000), *Ecologically Based Municipal Land Use Planning*. Lewis Publishers, London.
2. Lien, J. K. (2003), *Integrated Environmental Planning*. Blackwell Publishing. Oxford.
3. Ndubisi, F. (2012), *Ecological Planning*. John Hopkins University Press, Maryland.
4. Randolph, J. (2012), *Environmental Land Use Planning & Management*. Island Press, Washigton.

MEPM125 -Environmental Economics	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce a theoretical base for applying economic concepts to environmental issues.

Unit I Natural Resource and Economics 9

The Economies of resources - natural, renewable and non-renewable, man-made resources; Methods of valuation and quantification; Introduction to Revealed Preference Methods and Stated Preference Methods.

Unit II Values and Assessment of Ecosystem Services 9

Determining environmental values and ethics – User based perspectives; Quotas; Myopic optimal values; Principle of optimal control, Arriving at threshold values of consumption; Hedonic Pricing, Damage Cost, Travel Cost, Averting Behaviour Methods; Contingent Valuation, Contingent Behaviour Methods.

Unit III Pricing Mechanisms – Exhaustible Resources 9

Consumption patterns and its relation; non-renewable resource as a component of GDP, fiscal deficit and PPP; Deriving rents from exhaustible resources, pricing of exhaustible resource; Role of subsidy in non-renewable resources; Non-renewable resource problem: Steady states, conditions, Euler's equation, maximization problems.

Unit IV Pricing Mechanisms – Renewable Resources 9

Renewable resources: principles, theory, estimation, valuation; Case material discussion; Trends in prices and stock depletion.

Unit V Economies of Wastes and Energy 9

Waste as resource; waste as tool for revenue; Circular Economy; Waste to energy; energy needs and its implication to economic development.

Total: 45 Periods

Outcome:

- Knowledge on the theoretical base for applying natural resource economics concepts, including pricing mechanisms, to environmental concerns in the planning perspective.

Suggested Readings:

1. Meadows D H, Randers J., Meadows D L.; (2012), *The Limits to Growth. The 30-year update*. Chelsea Green Publishing, Vermont.
2. Perman R, Ma Y, (2011), *Natural Resource and Environmental Economics*. Addison Wesley, New York.
3. Schumacher E F. (1999), *Small Is Beautiful: A Study of Economics As If People Mattered*. Blond and Briggs, New York.
4. White B., Hanley N, (2013), *Introduction to Environmental Economics*. OUP, Oxford.

MEPM1210-Elective 1: Ecological Footprint and Carrying Capacity	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

Detailed understanding of Ecological footprint analysis as a contemporary tool related to carrying capacity.

Unit I Ecology in Planning 9

Definitions, types and principles of ecology and footprints, importance of urban and human ecology; Ecological theories and practices, principles and values towards planning and development

Unit II Carrying Capacity and Limits to Growth 9

Population ecology, carrying capacity and human population, understanding limits to growth; Consumption and its dimensions – food, energy, non-biodegradable items, travel, concept of ecological footprint – a land-based understanding of carrying capacity.

Unit III Ecosystems and footprints 9

Species evolution and interaction, implications of human intervention in ecological niche; biodiversity and its significance, valuation of biodiversity; Ecological impacts within evolving ecosystems; Delta and wetland ecosystems; arid and semi-arid ecosystems; Forest conservation in Asia and Africa.

Unit IV Footprint vis-a-vis Bio-capacity of Region and Settlement 9

Land equivalent of consumption; Energy-Land relation to assess footprints; Cropland footprint, grazing footprint, forest footprint, fishing ground footprint; Urbanisation in the context of footprints; Bio-capacity calculations for a region and its resource base; Assumption factors in bio-capacity, Regional Environmental Carrying Capacity.

Unit V Methods and Applications 9

Consumption land use matrix method for footprint calculations of settlements; Calculating individual footprints; Regional analysis in footprints; National Aggregated footprints; Income – trade – footprint relations; Footprints analysis as tool for sustainability studies, Undertaking case studies – Carrying capacity studies in urban and regional planning.

Total: 45 Periods

Outcome:

- Knowledge and application of the tool of Ecological footprint analysis.

Suggested Readings:

- 1) Collins A. (2015), *The Ecological Footprint: New Developments in Policy and Practice*. Elgar Publishing. Cardiff.
- 2) Global Footprint Network (2012), *Living Planet Report 2012: Biodiversity, Biocapacity and Better choices*. WWF International Press. California.
- 3) Meadows D H, Randers J., Meadows D L. (2012), *The Limits to Growth. The 30 year update*. Chelsea Green Publishing, Vermont.
- 4) Wackernagel, M. and W. Rees. (1996), *Our Ecological Footprint: Reducing Human Impact on the Earth*. New Society Publishers.

MEPM1211 Elective 2: Water-centric Planning & Management	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To impart detailed understanding of water resource, its planning and management at various spatial scale.

Unit I: Introduction

9

Water as a resource, Natural water cycle, Urban water cycle; Challenges in urban and regional planning; Historical Context and Evolution of Water management approaches including traditional/indigenous knowledge and practices, linkages with SDGs; Key concepts and casual relationships - water scarcity, water stress, water crisis, drought; watershed delineation; Best Practices in Water Management, Urban River Management Plan, Case Studies

Unit II: Water Resource Augmentation

9

Concepts of Water Security, Non-Revenue Water, Methods for assessing water availability, quality, and demand, water audit, impacts of climate change on water resources; examining hydrological data and hydro-geological analysis, Water footprint/budget at various spatial scale and its quantification techniques.

Unit III: Assessment Tools and Techniques

9

Introduction to various analytical, modelling and simulation techniques in hydrology and water quality assessment for spatial planning (Eg. The Soil & Water Assessment Tool, Water Quality Analysis Simulation Program, SCS-CN Method etc), flood assessment, simulation techniques and risk mapping, Sensitivity analysis, participatory approaches in water planning and management.

Unit IV: Integrated Water Resource Management

9

Flood/ Water stagnation risk management, Principles of integrated water resources management (IWRM), Enhancing resilience of water systems: green infrastructure, ecosystem-based approaches, Sustainable Urban Drainage systems, Nature Based Solutions; Case studies; Economic considerations in WRM

Unit V: Application of IWRM

9

Monitoring programs for long-term water management, National Water Policy 2012 and schemes, CHPEEO Guidelines for water supply and storm water systems, Preparation of detailed project report of water centric spatial plans at select scale

Total: 45 Periods

Outcome:

Advanced knowledge on water and wastewater treatment process in environmental planning process.

Suggested Readings:

1. Garg, S.K., (2005), *Environmental Engineering*. Vol.1 Khanna Publishers, New Delhi.
2. Modi, P.N., (2005), *Water Supply Engineering*. Vol. I Standard Book House, New Delhi.
3. Punmia, B.C., A K Jain and A K Jain,. (2005), *Water Supply Engineering*. LaxmiPublications (P) Ltd., New Delhi.
4. Ramesh G and Nagavdevara V P (2010), *Urban Infrastructure and Governance*.Routlege India, Delhi.

MEPM1212 Elective 3: Planning for Healthy Cities	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce and implement the concept of health promotion in urban settlements through urban planning tools and methods.

Unit I Basic Concepts and Terminology of Urban Health 9

Meaning of health, disability, wellbeing, and quality of life in the context of urbanization; Concepts of disease ecology, environmental and public health, health equity, diffusion of diseases in urban system.

Unit II Conceptual and Theoretical Basis for Healthy Cities 9

Public health in new era; health, environment and sustainable development; WHO Healthy Cities – concept and principles of planning for healthy cities; Built environment as a determinant of health; Global climate change and health impacts on cities, SDG and Health.

Unit III Urban Planning to Improve Health and Well-being 9

Understanding Health data for planning, non-segregated land use allocation and its implication on health; Urban green areas and their role; Creating environmentally sound urban corridors; Implications of urban wastes and municipal health; health impact assessment of development projects.

Unit IV Integrated Health Based Planning 9

Morbidity and mortality indicators; Integration of health elements with land uses; steps to promote healthy cities: identification of major health issues and health inequities, explore proximate and distal causes.

Unit V Urban HEART as Tool to Plan Intervention 9

Introduction to Urban Health Equity and Assessment and Response Tool (Urban HEART); Principles and pillars of Urban HEART; Social and economic determinants of health; social gradient in health; Tools and mapping of health inequities in urban areas.

Total: 45 Periods

Outcome:

- Understanding of implementation of concept of healthy cities for a sustainable future.

Suggested Readings:

1. Barton H. (2005), *A Health Map For Urban Planners: Towards A Conceptual Model For Healthy Sustainable Settlements*. Built Environment, Vol. 31:339-355.

2. Barton H., Claire M. and Catherine T. (2009), *Healthy Urban Planning in European cities*. Health Promotion International, Vol 24 (Suppl 1) : 91-99.
3. Barton H., Claire M. and Catherine T. (Eds.) (2003), *Healthy Urban Planning in Practice Experience of European Cities. Report of the WHO City Action Group on Healthy Urban Planning*. WHO Regional Office for Europe, Copenhagen.
4. WHO, Centre for Health Development (2008), *Our cities, Our health, Our future*. Report to the WHO Commission on Social Determinants of Health. NY.

MEPM1213 – Planning for Resilient Infrastructure	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To inculcate advanced knowledge on building resilience for infrastructure systems at various scales

To be Developed

THIRD SEMESTER

MEPM211 Regional Environmental Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	0
	Studio/Lab/Workshop/Practical	12
	Total Periods per Week	15

Objective:

To be able to apply environmental planning techniques for detailed environmental impact assessment at a regional scale.

Literature and Documentary Review on the selected themes **15**

Part A Natural Resource Baseline Studies and Regional Assessment **30**

Detailed environmental studies to establish baseline of different components of environment at the regional level; Identification of key environmental issues at the regional level and their interrelations.

Part B Environmental Assessment towards Integrated Environmental Development Plan at a District / Regional level **180**

Detailed Assessment of Environmental Status (all components) through primary and secondary surveys, identification of sources, levels of issues and problem analysis. Students to be taken to live case area/ region/ district to undertake the exercise culminating in the preparation of Integrated Environmental Development plan at a district / regional level / special investment regions/ DFC/ Industrial Development Corridors/ Coastal Regions/ environmental regulations at a district or regional level OR development of conservation plan

Note:

1) *Management and implementation of proposals are to be emphasised at every level of strategisation. To bring an holistic and pragmatic dimension to the Masters course, five core underlying parameters of a) Sustainability, b) Equity, c) Efficiency, d) Harmony, and e) Safety, are to be incorporated in the instruction strategies through case studies and examples, wherever applicable.*

2) *Focus is to be on identifying and analysing environmental concerns in the studio exercise.*

Total: 225 Periods

Outcome:

Acquiring knowledge and skill-sets on baseline studies, detailed analysis, projections etc. of environmental components and other development sectoral components at regional level to prepare management plans.

Suggested Readings:

1. Daniels T (2012): *Environmental Planning Handbook: For Sustainable Communities and Region*. APA Planners Press. NY.
2. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), *Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines*. Vol. 1, Ministry of Urban Development, New Delhi.
3. Ministry of Urban Development (2012): *Handbook of Service Level Benchmarks*. Govt of India. Delhi.
4. Padt (2007): *Green Planning: An Institutional Analysis of Regional Environmental Planning in the Netherlands*. Taylor & Francis, NY.

MPIS212 Research Methods	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To initiate the planning thesis by enabling students to identify a topic and then develop a proposal and methodology in detail besides providing them with the required theoretical inputs on the syllabus contents.

Unit I Introducing Research

9

What is research? Types of research, basics of academic and applied research; Different approaches to research; Research philosophies – positivist and phenomenological philosophies. Introduction to elements of research: epistemology, theoretical perspective, methods, methodology; Justification of choice and use of methods and methodology; Paradigms in research.

Unit II Developing Thesis

9

Research methodology: Quantitative – surveys, experimental, longitudinal, cross-sectional studies; Qualitative – case studies, action research, ethnography, participative enquiry, grounded theory. Content development - Developing contextual background; Research design; Identification of research problem; Research questions; Formulation of hypothesis; Writing aims, objectives, scope and limitations; Review of relevant literature; Identification of suitable research methods/ techniques/ instruments; Data collection – questionnaires, sampling techniques, observation, interviews; Analysis - qualitative and quantitative analysis, data synthesis; Research outcome – research findings

Unit III Research Ethics

9

Prior permission and intimation, conduct of interview, asking right question, confidentiality, elimination of bias and suspicion; Roles and social responsibilities of the researcher; Time management in research.

Unit IV Field Work Plan

9

Survey format preparation, study area identification and map preparation; Work plan schedule.

Unit V Research Communication

9

Research vocabulary, Reading – notes taking, material organisation, indexing; Technical writing – content synthesising, paraphrasing, citation and referencing; Academic writing – research proposal / synopsis, abstract writing, report writing and mapping; Presentation: effective oral communication – content structuring, voice modulation, body language, audio-visual aids, hand-outs.

Total: 45 Periods

Outcomes:

1. Basic knowledge on research methods and techniques.
2. Capability to formulate research design and proposal.

References:

1. Crotty M. (2012), Introduction: The Research Process, the Foundations of Social Research, Meaning and Perspective in the Research Process. Sage Publications, New Delhi.
2. Frankfort, Nachmias, C., & Nachmias, D. (2008), Research Methods in the Social Sciences. Worth, New York.
3. Keith F. Punch (2013), Introduction to Social Research: Qualitative and Quantitative Approaches. Sage Publications, London
4. Neville, Colin (2007), An Introduction to Research and Research Methods. Effective Learning Services, School of Management, University of Bradford, United Kingdom

MEPM213 Environmental Impact Assessment Techniques	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce a theoretical base for application of environmental impact assessment in development planning.

Unit I Role of EIA in the planning and decision-making process 9

Need for EIA; approaches to EIA and its relation with planning practise; EIA: Origin and Development; EIA in Indian context; Legislative context of EIA in India– EIA Notifications and amendments; SEA and Land use Planning.

Unit II Overview of Processes for Impact Studies 9

Conceptual Approach; Proposal, Study Formulation, Responsibilities assignment; Overview of key steps and procedures; Screening of Projects for EIA in Indian context; Process Flow of EIA; Guidelines and Terms of Reference for EIA.

Unit III EIA Methods 9

Categories of EIA Methodologies; Check List Methods - Quantitative Checklists, Multi Attribute checklists, Matrixes Methods - Leopold Matrix, Magnitude Matrix, Weighted Matrix; Network Methods – Causal Diagrams for Impact Predictions.

Unit IV Impact Prediction and Mitigation Methods 9

Determination of Environmental Impact; Importance and Determination of Weightages; Measurement of Impacts: Impact Prediction and Evaluation – CBA, Planning Balance Sheets; Impact Mitigation case studies and best practices; Comparison of Alternatives; Evaluating non-technical summaries; critical evaluation and appraisal of EIA reports; case studies.

Unit V Concept of Social Impact Assessments 9

Types of Socio-economic Impacts; Basic Steps in carrying out socio-economic impact assessment; Environmental Settings Description; Analysis of Public Services and Facilities; Impacts of Economic Profile of Community; Prediction and Changes in Socio-economic Factors; Case studies.

Note: Identifying and analysing environmental concerns in the concurrent studio exercise of may be taken up for detailing.

Total: 45 Periods

Outcome:

- Knowledge on EIA and SIA and its application in spatial planning.

Suggested Readings:

- 1) Richard K. M. (2002), *Environmental impact assessment, a methodological perspective*. Kluwer Academic Publishers, Boston.
- 2) Morris P. and Therivel R. (2010), *Methods of EIA – 3rd Edition*. Routledge, London.
- 3) Ministry of Environment and Forests (2010), Environment (Protection) Rules, 1986 – Amendment – National Environmental Policy”
- 4) Ministry of Environment and Forests (2012), *Terms Of Reference [ToR] For EIA Report*. Govt. of India, Delhi.

MEPM214 Project Planning & Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce aspects of project planning, management, implementation and appraisal.

Unit I Introduction to Project Planning 9

Introduction to Projects, Project Classification, Nature of planning projects, Project life cycle, Methodology for project identification and formulation; Preliminary screening, Project Rating, Detailed project report, and feasibility studies

Unit II Project Formulation and Appraisal 9

Projects and planning issues including sectoral policy at local, State, and National levels; Project appraisal: technical, financial, social, economic, environmental, Approaches of appraisal - World Bank and Asian Development Bank methods, institutional approaches, SCBA, UNIDO etc.

Unit III Project Management 9

Project characteristics; techniques of management, Importance of project management; PERT & CPM; new techniques of management by objective (MBO).

Unit IV Pre-implementation Planning Phase 9

Work-Break Down Structure; Network Analysis; CPM, PERT; Resource Levelling and Allocation; Time-Cost Trade Off Aspects. Hands on exercise using Project Management Software like MS Project, Primavera, etc.

Unit V Project Implementation, Monitoring and Evaluation 9

Project implementation, stages of implementation; actors in projects implementation; project monitoring; meaning objectives and significance; monitoring techniques; integrated reporting, milestones, time and cost over-run and under runs, unit index techniques; project evaluation; Techniques of project evaluation; Case studies in urban and regional planning projects.

Total: 45 Periods

Outcome:

- Capability to formulate, appraise and manage the projects related to spatial planning

Suggested Readings:

1. Albert Lester (2007), *Project Management, Planning and Control*, Butterworth Heinemann publishing house, United Kingdom.
2. Harold R. Kerzner (2013), *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, John Wiley & Sons, New Delhi.
3. Jose Maria Delos Santos (2013), *Project Management Absolute Beginner's Guide – A Book Review*, QUE Publishing house, New Jersey.
4. Ramakrishna K (2010), *Essentials of Project Management*, PHI Publishing house, New Delhi.

MEPM215 Energy Studies in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To introduce the fundamental concepts of quantification-based assessment of energy consumption.

Unit I Principles of Energy: Sources and Consumption 9

Energy Demand and Supply; sources of energy and typology of energy available at source; Quantification of Resource Consumption and patterns of consumption; Relating energy consumption patterns with sectors – residential, commercial, transport, etc.

Unit II Cluster & Group Based Energy Use 9

Energy efficiency and ISO; Introduction to ISO; ISO-14000 and its Planning Implications; Case Study of an ISO certified industry, Environmental and Financial Benefits of ISO; Cluster Based Environment Management approach & Group Environmental Management System.

Unit III Monetary valuation techniques 9

Monetary valuation techniques – Cost Benefit Analysis, Natural Resource Accounting, Pricing, Non-use Value, Techniques of monetary evaluation/ valuation methodologies; Energy Audit; Conservation Issues.

Unit IV CDM and Carbon Credit 9

Concepts of cleaner development mechanism; Life cycle analysis; Carbon trading / GHG emissions.

Unit V Integrating Energy Efficiency in Planning 9

Energy vis-a-vis concept of smart cities; Solar city mission in India; Renewable energy concept and its application in planning; Green cities and its energy implication, energy footprint, Carbon neutrality, Net-Zero Pathways.

Total: 45 Periods

Outcome:

- Understanding energy consumption, assessment, accounting and auditing for promoting efficient energy use.

Suggested Readings:

1. Ercoskun O Y (2012): *Green and Ecological Technologies for Urban Planning: Creating Smart Cities*. IGI Global.
2. Khalil H and Khalil E. (2015): *Energy Efficiency in the Urban Environment*. Taylor & Francis, London.
3. Sheperd W and Shepard D (2014): *Energy Studies*. Imperial College Press, London.
4. UN Habitat & ICLEI (2009): *Sustainable Urban Energy Planning. A handbook for cities and towns in developing countries*. UN Press, NY.

MEPM2110 Elective 1: Human Settlements and Climate Change	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To study human settlements in climate change perspective and understand strategies for adaptation and spatial planning tools for mitigation of GHG emissions.

Unit I Introduction to Climate Change 9

Concern, Climate science, evidences of climate change, human settlements as a major source of emissions, Impacts of climate change, emission paths, strategies, location of settlements, socio-economic characteristics, cultural practices and governance structure, suitable interventions.

Unit II Climate Risk and Vulnerability in the City 9

Hazard and Vulnerability mapping, Risk assessment, Impacts on settlements due to flooding, cyclones and landslides, Critical infrastructure; Urban governance and participation.

Unit III Urban GHG Emissions 9

Emission pathways, Sectoral emission – residential, industrial, transport, waste disposal, reducing emissions and urban carbon footprints, carbon trading and other alternatives.

Unit IV Climate Change Mitigation and Low-Carbon Cities 9

Climate governance and Climate Finance; Energy efficient approaches and transportation systems for the future; land-use planning and compact cities, future and smart cities in the light of climate change; reducing the urban heat islands, protecting urban water systems from climate change risks.

Unit V Adaptation – Towards Climate Resilient Cities 9

Climate change adaptation – migration as adaptation, climate change experiments and alternatives, Climate change, Vulnerable Regions and Groups – Tropics, farmers, gender, children, poor and migrants, Climate Risk Assessment Frameworks.

Total: 45 Periods

Outcome:

- Estimating urban GHG emissions, risk assessment, vulnerability and adaptation to climate change

Suggested Readings:

1. Betsill M (2005): *Cities and Climate Change*. Routledge, London.
2. Harriet Bulkeley (2013): *Cities and Climate Change*. (Routledge Critical Introductions to Urbanism and the City), Routledge, New York.
3. Rosenzweig C. (2011): *Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network*. Cambridge University Press, Cambridge.
4. Zimmermann O (2011): *Resilient Cities*. *Cities and Adaptation to Climate Change - Proceedings of the Global Forum 2010*. Springer.
5. Lehmann S (2015), *Low Carbon Cities- Transforming Urban Systems*, Routledge Publications, New York.
6. Nikolas Bader and Raimund Bleischwitz (2009) *Measuring Urban Greenhouse Gas Emissions: The Challenge of Comparability*, *Cities and Climate Change*, Vol. 2 (3).
7. P.Neeraj et al (2008), *Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters*, World Bank Publications.

MEPM2111 Elective 2: Integrated Waste Management	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To study wastes as a by-product of urbanisation, with particular emphasis of hazardous wastes, its treatment and legislative implications.

Unit I Wastes, Hazardous Wastes and its Types 9

Typology of wastes – municipal wastes, domestic wastes, industrial wastes, bio-medical wastes – dry and wet wastes, organic and inorganic wastes; characteristics of wastes; generation of wastes - sources and composition, standards and rates off generation; collection, transportation and disposal of wastes; municipal waste management rules.

Unit II Industrial Waste and Related Legislative Frameworks 9

Industrial wastes as sources of pollution for water, air and soil; legislations related to industrial pollution; categorisation of industries as per pollution; industrial consumption of energy and its relation to waste generation; disposal standards in industries; legislative procedures of waste management in industries, industrial estates and corridors.

Unit III Bio-Medical Wastes and related Legislative Frameworks 9

Categorisation of bio-medical wastes, process of transport, treatment and disposal of medical wastes, generation standards as per beds; Existing rules related to disposal of bio-medical wastes.

Unit IV Liquid Waste Management 9

Waste water generation and characterisation, collection, treatment systems in urban and rural areas, Criteria for selection of Technology, On-site Waste water treatment systems, Decentralised Waste water treatment systems, Technological options for composting of Organic wastes, Types of Drain, Components of Sewer System, Technology for Waste Water Treatment.

Unit V Integrated Waste Management Plan 9

Different methods of waste treatment; Refuse, Reduce, Reuse, Recycle – comparative analysis; Requirements of land, expertise, energy and costs related to different treatment methods, City sanitation plans in India; Service level benchmarks in waste management; Waste to energy as a concept – advantages and disadvantages; Waste to Wealth - earning from wastes; Circular Economy, Governance models in waste management. Case Studies on Integrated Waste Management Plans.

Total: 45 Periods

Outcome:

- Specialised knowledge on waste management, and how to incorporate this into spatial planning.

Suggested Readings:

1. Bhatt M S. and Illiyan A. (2012). *Solid Waste Management: An Indian Perspective*. Synergy Books India. Delhi
2. Kreith F. and George T. (2002). *Handbook of Solid Waste Management*. McGrawHill Publishers. New York.
3. Micheal D L. Philip B. (2010) *Hazardous Waste Management*. Waveland Press. London.
4. Vaughn J. (2009). *Waste Management: A Reference Handbook. Contemporary world issues*. ABC Press, New York.

MEPM2112 Elective 3: Environmental Data Analytics	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To impart advanced knowledge and skillsets related to the data analysis for various environmental projects.

FOURTH SEMESTER

MEPM221 Environmental Planning Thesis	Subject Category	SC
	Number of Credits	24
	Lecture Periods per Week	2
	Tutorial Periods per Week	0
	Studio/Lab/Workshop/Practical	22
	Total Periods per Week	24

Objective:

To enable the students to undertake original and independent study / research in the form of terminal thesis / project on a topic of their choice approved in the previous semester.

Each student of the M. Planning (Environmental Planning and Management) course is required to undertake a terminal project on a subject related environmental planning concern with respect to urban, rural, or regional development as approved by the Department in the third semester in the course Research Methods (MPIS 212).

The terminal project will provide an opportunity to the student to synthesise the knowledge and skills acquired through the learning of various theories and practices during the course and apply it for strategy formulation for a live planning challenge.

The terminal project shall be monitored continuously and periodically through internal marked reviews to check the consistency of work, the relevance of the analysis with respect to the data collected and project scope, and the progress towards logical proposals. The final output shall be firstly in the form of an extended abstract, which once approved by the department will be followed by the submission of a detailed report and drawing/visuals for external jury members, in a given format. The terminal project shall also be presented orally in external jury by each student in the form of visuals / drawings as necessary for each topic. Each stage shall be evaluated by a panel. These stages may broadly be outlined as:

Unit I Thesis Proposal

Unit II Development of Suitable Methodology / Framework

Unit III Literature Search and Review

Unit IV Data Collection, Analysis and Synthesis

Unit V Findings / Proposals

Total: 225 Periods

Outcome:

The final output shall be in the form of a draft report, which once approved by the department will be followed by the submission of a detailed report and drawing/visuals for external jury members, in a given format. The thesis shall also be presented orally in external jury by each student in the form of visuals / drawings as necessary for each topic.

Suggested Readings:

1. Elizabeth A. Wentz (2013), *How to Design, Write, and Present a Successful Dissertation Proposal*, Sage Publications.
2. John Biggam (2015), *Succeeding with Your Master's Dissertation: A Step-By-Step Handbook*, Open University Press, McGraw Hill Education, UK.
3. Murray, Rowena (2011), *How To Write A Thesis*, Open University Press, McGraw Hill Education, UK.
4. Tayie, Sami (2005), *Research Methods and Writing Research Proposals*, Pathways to Higher Education, Cairo.

MEPM222 Environmental Justice and Professional Practise	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To make the students aware of the different aspects of the environmental problems and their relationship to culture and to raise important issues related to ethics, justice and politics in environmentalism.

Unit I Cultural Landscapes 9

Cultural landscapes; ideas of Carl Sauer, elements of cultural landscape; people, nature, values, places; World Heritage cultural landscapes – clearly defined, organically evolved and associative cultural landscapes; Cultural values and urban planning.

Unit II Ethics and Environmentalism 9

Dispersal of causes and effects of the current environmental problems; social implications of ecologically sensitive land transformation; issues of spatial equity -differential consumption patterns around the globe; inter-generational equity; ethical questions in the environmental debate and the idea of the moral storm; environmental movements in India – networks; organised action, civil societies and citizens as environmental actors; SIA in India.

Unit III Climate Justice 9

Climate change Protocols and Conventions; National action plan for climate change (MoEF) and other related initiatives; the idea of climate justice; environmental rights, positive and negative rights; survival and luxury emission rights, international law and climate justice; the role of international organisations in ensuring climate justice; Adaptation, new technologies with examples.

Unit IV Society and Nature: Social construction of global climate change 9

Ecosystem services; social systems in relation to environmental systems; environmental determinism and cultural determinism; capitalism, consumerism and society and its impacts on the environment; Urban sprawl and climate change; Transport and Environment; Tourism and Environment; international case studies on social and environmental systems; Ecological responsibility; Smart urban systems.

Unit V Professional Practice in Environmental Projects 9

Terms of references (ToRs) – development, significance and adherence; detailed feasibility reports as per ToRs; compliance reports; inception reports; closure documents in context of ToRs; Scale of professional fees and charges; preparation of consultancy proposals; Agreements and contracts; Organising and establishing office; Performance appraisal etc.

Total: 45 Periods

Outcome:

- Inculcate awareness, concepts of justice and environmental ethics in the planning process, and technical know-how on professional practice with respect to Indian context.

Suggested Readings:

1. Steve Vanderheiden (2008) *Political Theory and Global Climate Change*, MIT Press, Massachusetts
2. Konstantinos T, Kalevi K, Stephen V, VesaYli-Pelkonenc, Aleksandra Kazmierczak, JariNiemelac, Philip James (2007), "Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review", *Landscape and Urban Planning*, 81 (2007) 167–178
3. Brian Roberts, Peter Atkins, Ian Simmons (2014) *People, land and time: an historical introduction to the relations between landscape, culture and environment*, Routledge, New York.
4. Sandler R (2007): *Environmental Justice and Environmentalism: The Social Justice Challenge to the Environmental Movement*. MIT Press, Massachusetts.
5. Campbell, H. and Marshall, R. (1998) Acting on Principle: Dilemmas in Planning Practice, *Planning Practice and Research*, Vol.13, No.2, pp.117-128.
6. Kulshreshtha, S.K. (2012) *Urban and Regional Planning in India - A Handbook for Professional Practice*. SAGE Publications India Private limited, New Delhi.

MEPM223 Environmental Law, Policy and Governance	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical	0
	Total Periods per Week	3

Objective:

To develop knowledge of key policies, legislations and regulations related to Environment in India by discussing aspects regarding constitutional mandates, bare act provisions, institutional reformation brought about, role of judiciary and role of civil society.

Unit 1 Introduction to Environmental Law and Governance

9

Concept of Law; Sources of law; meaning of the term of law, legislation, ordinance, bill act, regulations and bye-laws; legislations as a tool for environmental protection; Evolution of environmental legislation in India and over view; The doctrine of separation of powers; judiciary, legislature and executive – rule of law; significance of law and its relationship to environmental planning; Right to property versus power of eminent domain; concept of governance and good governance; International actors, conventions and protocols.

Unit II International Environmental Principles

9

Introduction to internationally practiced environmental principles; Permanent Sovereignty over Natural Resources; Polluter Pays Principle; Precautionary Principle; Obligation not to cause transboundary environmental damage; Intergenerational Equity; Sustainable Development; Cases of environmental principles in practice.

Unit III Natural Resources and Man-made Resources and their Governance in India

9

Constitutional Provisions related to Environment in India; Environmental Protection Act of India 1986; Environment in 73/74 CAA; the Indian Forests Acts 1927, Forest Conservation Act (1980); Forest Rights Act (2006); Air (Prevention and Control of pollution) Act; Water (Prevention and Control of pollution) Act; The Indian Wildlife Protection Act, 1972; Mines and minerals Act 1952 and 2011; Hazardous Waste Management and Handling Rules / Biomedical Rules / Solid Waste Management Rules; related case laws.

Unit IV Environmental Policies

9

National Conservation Strategy and Policy Statement on Environment and Development, 1992; National Environmental Policy 2006, Coastal Regulations Zone Act, Sector based policies – Agriculture; Population; Water etc.; National Land Utilization Policy; Significance of National Biodiversity Boards and State Biodiversity Boards.

Unit V Disaster Management and Environmental Jurisprudence in India

9

Natural and manmade disasters and the role of state apparatus, judiciary, civil society and media in developing disaster resilience; Planning for Disaster Management – DRR, DM Act and Policy, preparedness and post disaster management. Role and significance of MoEF; Establishment of PCBs; Appellate Authority Act; National Green Tribunal; other related notifications.

Total: 45 Periods

Outcome:

- Knowledge on select Indian constitutional provisions and environmental legislation related to spatial and environmental planning; and governance and administrative/government bodies wrt. environmental components.

Suggested Readings:

1. Banerjee,D. (2008). Environmental Jurisprudence in India: a look at the Initiatives of the Supreme Court of India and their Success at Meeting the Needs of Enviro- Social justice. Paper selected for oral presentation at International Congress of Environmental Research, December 2008.
2. Damodaran A. (2012), 'The Challenge of Multi Level Environmental Governance In India', PeriodicaOeconomica, Pp. 29–37.
3. Raghav Sharma, 'Green Courts in India: Strengthening Environmental Governance?' 4/1 Law, Environment and Development Journal (2008), p. 50, available at <http://www.lead-journal.org/content/08050.pdf>.
4. Verghese, B.G.(2013).Environmental governance in India: The challenge of multiple transitions. Commonwealth Governance Handbook 2013/14, pg. 120-122.

Master of Planning

(Urban and Regional Planning)

Course Structure and Detailed Syllabus for
Two Year Masters Degree Programme in Planning

Effective from the Academic Year 2024-25 onwards

(As Approved by the Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाडा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA.

Introduction to Master of Planning (Urban and Regional Planning)

Master of Planning (Urban & Regional Planning), abbreviated as M. Plan (URP), is a two-year full-time PG programme in Planning offered by the School of Planning and Architecture, Vijayawada specialising in Urban & Regional Planning.

The key objective of the course is to equip students with the skills required to comprehend urban and regional issues and to analyze the physical, socio-economic, cultural, political, and ecological dimensions of human settlements. The course is designed to provide necessary exposure to various planning processes, emerging trends, and advanced technical know-how. It aims to contribute towards the creation of professionals in the field and to cater to the specific needs of the industry and academia. During the course, students will be provided with ample opportunities to interact with subject experts, relevant organizations, etc. The course enables students to gain real-time experience through their involvement in ongoing or live projects.

The M. Plan (URP) is a two-year program spread across four semesters. The course structure and syllabus are designed with coherence and reference to the Model Curriculum for Master of Planning by the All India Council for Technical Education (AICTE) 2020 and Model Curriculum for Master of Planning by ITPI, Orienting Planning Education in Line with NEP 2020. The curriculum integrates a variety of subjects, including studios, labs, theory, and field visits. The syllabus integrates a range of courses to provide a comprehensive education in urban and regional planning. Planning Studio courses engage students to participate and learn from the field based projects through experiential work, the professional and foundation courses aim at basic and comprehensive knowledge and coherent understanding of the subjects. The Interdisciplinary courses allows the students to develop the professional capabilities in a range of disciplines. The lab-based courses emphasizes on digital skills prepares students for the tech-driven industry. Analytical skill development is also prioritized in few core subjects, equipping students to assess complex data and make informed decisions. This multifaceted approach aims to produce skilled professional's adept at addressing diverse planning challenges

The broad course structure of the programme is as follows:

The **first semester** is an integrated semester common to all master courses of planning offered by the school. The studio focuses on area planning. Subjects offered are introduction to planning theories and concepts, data analytics and techniques in planning, habitat and environmental planning, infrastructure planning, and socio-economic dimensions in planning.

The **second semester** focuses on urban planning, emphasizing practical and theoretical aspects. The main studio is dedicated to the preparation of development plans and city master plans, providing hands-on experience. Subjects offered are geomatics and analytics in planning, city and metropolitan planning, land economics and management, advanced infrastructure planning, and planning legislation and governance. The semester also offers elective subjects such as inclusive planning, social impact assessment and rehabilitation planning, smart cities, urban renewal, and conservation. Additionally, non-graded audit courses designed such as yoga, dance, music and NSS to enhance the physical well-being of the students are also offered

The **third semester** focuses on regional planning. Subjects offered in this semester are research methods, rural planning and development, project planning and management, and disaster preparedness and management. Elective subjects such as human settlements and climate change, special area planning, future settlements, tourism planning, and advanced quantitative methods are offered. Additionally, non-graded audit courses designed to enhance physical well-being are available.

In the **fourth semester**, students would be required to undertake thesis. In addition, two theory subjects are offered. These include development finance, and professional practice in planning.

There are fifteen electives (including professional electives) and eight audit courses offered in the second and third semesters in total in MURP. Each subject is divided into five sections consisting of the subject details, objective, units and suggested readings. The subject syllabus is broken into progressive sections through the units, to be taught over the semester. However, it may be noted that the syllabus covered is not exhaustive and the individual subject teacher may augment the syllabus as per his/her perception of the subject with prior concurrence of the Head of the Department.

The five underlying principles of 'Sustainability, Equity, Efficiency, Harmony, and Safety' are to be emphasized as a cross-cutting theme in executing planning lab/studio exercises and application of theory subjects. The syllabus also introduces concepts of Indigenous Knowledge Systems (IKS) in Environmental Planning and Management. The syllabus is designed so as to develop strong communication, interpersonal, advocacy and analytical skills of the student. The course endeavours to give real time experience to students through their involvement in the ongoing or live projects. The programme is designed to enable the growth of the students into professionals in the field, who are not only environmentally sensitive in their planning approaches but are versed with the know-how of the state-of-the-art techniques in the industry.

Course Structure**FIRST SEMESTER (INTEGRATED)**

S. No.	Subject Code	Subject Title	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MPIS111	Area Planning Studio	3	0	12	15	15	SC
2	MPIS112	Planning Theories and Concepts	2	1	0	3	3	TC
3	MPIS113	Data Analytics and Techniques in Planning	2	1	0	3	3	TC
4	MPIS114	Habitat and Environment Planning	2	1	0	3	3	TC
5	MPIS115	Infrastructure Planning	2	1	0	3	3	TC
6	MPIS116	Socio-Economic Dimensions in Planning	2	1	0	3	3	TC
TOTAL			13	5	12	30	30	

SECOND SEMESTER

S. No.	Subject Code	Subject Title	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MURP121	Urban Planning Studio	3	0	12	15	15	SC
2	MURP122	Geomatics and Analytics in Planning	1	1	1	3	3	JC
3	MURP123	City and Metropolitan Planning	2	1	0	3	3	TC
4	MURP124	Land Economics and Management	2	1	0	3	3	TC
5	MURP125	Planning Legislation and Governance	2	1	0	3	3	TC
Elective 1: ANY ONE								
6	MURP1210	Inclusive Planning	2	1	0	3	3	OE
7	MURP1211	Social Impact Assessment and Rehabilitation Planning	2	1	0	3	3	PE
8	MURP1212	Smart Cities	2	1	0	3	3	OE
9	MURP1213	Urban Renewal and Heritage Conservation	2	1	0	3	3	PE
10	MURP1214	Systems Thinking and System Dynamics	2	1	0	3	3	OE
12	MURP1215/ MTP 124	Urban Transport Planning	2	1	0	3	3	OE
13	MUPR1216	From Other Masters Programme (Same Semester) / online platform duly approved the department	2	1	0	3	3	OE
ECOC Audit Courses: ANY ONE								
11	ECOC1	To be Chosen						A
12	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
13	PBOC1	To be Chosen						A
14	PBOC2	To be Chosen						A
TOTAL			12	5	12	30	30	

Note1: Compulsory Summer Professional training / internship (of six weeks) after second semester is to be undertaken by each student. The compulsory training shall be deemed as completed only when the Department of Planning examines the work of each student in the subsequent third semester and declares it to be "Satisfactorily Completed".

THIRD SEMESTER

S. No.	Subject Code	Subject Title	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MURP211	Regional Planning Studio	3	0	12	15	15	SC
2	MPIS212	Research Methods	2	1	0	3	3	JC
3	MURP213	Rural Planning and Development	2	1	0	3	3	TC
4	MURP214	Project Planning and Management	2	1	0	3	3	TC
5	MURP215	Disaster Preparedness and Management	2	1	0	3	3	TC
Elective 2: ANY ONE								
6	MURP2110	Human Settlements and Climate Change	2	1	0	3	3	OE
7	MURP2111	Special Area Planning	2	1	0	3	3	PE
8	MURP2112	Future Settlements	2	1	0	3	3	OE
9	MURP2113	Tourism Planning and Development	2	1	0	3	3	OE
10	MURP2114	Planning and Politics	2	1	0	3	3	PE
11	MURP2115	Advanced Quantitative Methods for Planning	2	1	0	3	3	OE
12	MURP2116	Principles of Sustainable Development	2	1	0	3	3	OE
13	MURP2117	Globalization & Social Equity	2	1	0	3	3	PE
14	MURP2118	Indian Knowledge Systems	2	1	0	3	3	OE
15	MURP2119	From Other Masters Programme (Same Semester) / online platform duly approved the department	2	1	0	3	3	OE
ECOC Audit Courses: ANY ONE								
16	ECOC1	To be Chosen						A
17	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
18	PBOC1	To be Chosen						A
19	PBOC2	To be Chosen						A
TOTAL			13	5	12	30	30	

FOURTH SEMESTER

S. No.	Subject Code	Subject Title	Distribution of Periods Per Week			Total Periods Per Week	Credits	Subject Category
			L	T	S/P			
1	MURP221	Planning Thesis	2	0	22	24	24	SC
2	MURP222	Development Finance	2	1	0	3	3	TC
3	MURP223	Professional Practice in Planning	2	1	0	3	3	TC

Note 2: Credits for each subject are the same as the number of lecture / practical hours per week, whichever is higher.

Subject Code Nomenclature:

MPIS111 is to be read as:

MPIS = Masters in Planning (Integrated Sem); 1 (1st digit) = 1st Year;
1 (2nd digit) = 1stSem of 1st Year; 1 (3rd digit) = 1st Subject.

MURP211 is to be read as:

MURP = Masters in Urban and Regional Planning; 2 (1st digit) = 2nd Year;
1 (2nd digit) = 1stSem of 2nd Year; 1 (3rd digit) = 1st Subject.

MURP2110 is to be read as:

MEPM = Masters in Urban and Regional Planning;; 2 (1st digit) = 2nd Year;
1 (2nd digit) = 1stSem of 2nd Year; 10 (3&4th digit) = 1st Elective Subject.

Subject Category Nomenclature:

SC = Studio Core Subject	TC = Theory Core Subject	JC = Jury Core Subject
PE = Professional Electives	A = Audit Subjects	OE = Electives from Other Masters Programme (Same Semester), online platform duly approved by the department

SC (Studio Core Subject): These subjects are the practical backbone of the curriculum, focusing on hands-on projects and real-world applications, essential for mastering planning skills.

TC (Theory Core Subject): These subjects provide the theoretical foundation, covering key concepts, methodologies, and frameworks necessary for understanding urban and regional planning.

JC (Jury Core Subject): These subjects involve assessments and presentations, where students present their projects and designs before external experts at the end of the semester, fostering evaluation and feedback.

PE (Professional Electives): These subjects focus on advanced professional skills and knowledge, preparing students for specific career paths within the planning industry.

OE (Electives from Other Masters Programme - Same Semester): These subjects provide an interdisciplinary approach by allowing students to take courses from other master's programs, broadening their academic perspective.

ECOC and PBOC are the open electives that are non-graded courses.

Detailed Syllabus

Master of Planning **(Urban and Regional Planning)**

First Year – First Semester – Integrated Semester

MPIS111- Area Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practicals	12
	Total Periods per Week	15

Objective:

- To enable the students to understand the socio-economic and spatio-cultural, environmental characteristics along with the land-use dynamics of the study area.
- To plan for rational physical and socio-economic interventions for sustainable and harmonious development of the future.

Part A: Literature and Documentary Review on the selected themes **15**

Area Appreciation at the Neighbourhood level **30**

Understanding the linkages between different aspects of socio-economic life in relation to the land-use in the cities. Preparation of area profiles in the city, such as residential, commercial, recreational, industrial, slum area and institutional area. Studying impact of land use, economic and socio-cultural activities on the physical environment of the area.

Part B: Village Planning **60**

Preparation of plans for the identified village/s by studying the physical, socio-cultural, economic, environmental and governance aspects. Understanding how development impacts villages and the communities. Appreciating the need for balancing development with sustaining the livelihoods of rural communities and drawing plans for suggested interventions for the community. Community Engagement and Integrating Indian Knowledge System (One week field visit including community engagement)

Part C: Local Area Planning/ Area Development Planning **120**

Preparation of neighbourhood plan considering different user groups. This may involve the preparation of local area plans/ area development plans/ residential / site plans (low and high density) preferably for areas where new developments are coming up.

Students need to understand the need for a balanced development with incorporation of elements like sustainability, livelihood, environmental protection, inclusive growth and institutional engagement. In addition, emphasis will be given on planning terminologies, strengthening the planning vocabulary and technical communication skills.

Total: 225 Periods

Outcomes:

- Basic knowledge and skillset to prepare the grassroots level plans
- Capability to prepare local area/ sub-city level plans by integrating the sectoral needs
- Students' skills in area appreciation, mapping and site planning techniques

References:

1. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Vol. 1, Ministry of Urban Development, New Delhi.

2. Manitoba Intergovernmental Affairs and City of Winnipeg's Planning, Property and Development Department – Planning and Land Use Division (2002), A Guide for Developing Neighbourhood Plan.
3. Thomas Russ. R(2009), Site Planning and Design Handbook. McGraw Hill Publications.
4. Singh. K (2009), Rural Development Principles, Policies and Management. Sage Publications, Pvt. Ltd, New Delhi.
5. Gram Panchayat Spatial Development Plans as developed under the guidelines of MoPR, GoI

MPIS112 - Planning Theories and Concepts	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To equip the students with the required knowledge of conventional and contemporary planning thought, pluralistic nature of values in the profession, planning approaches and models. Focus would be on integrating procedural and substantive elements of planning theory to current and future planning practices

Unit I Planning Concepts**9**

Settlement systems, Classification of settlements, primate city, central place concept, concepts of complementary area, central goods and services, range, threshold etc; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; push and pull factors; migration; need for planning; Scalar arrangements in Planning (regional, mega, metro regions, city and local area plans).

Unit II Rational Planning Approaches and Models**9**

Systems approach to planning; Comprehensive development plan; Pluralism in planning; Strategic planning; Structure plans; Incremental planning; Equity based planning; Inclusive planning; Participatory planning – Collaborative and communicative planning; Introduction to Political economy model, New economic geography models & globalisation models.

Unit III Techniques of Plan Preparation**9**

Surveys, Techniques of conducting surveys for land use, building use, density, structural condition of buildings, heights of building, land utilization and physical features of land; Techniques of mapping – methodologies, physical surveys, land use classification, base map preparation for various levels of plans; Choice of appropriate scales for various types of plans; Data requirement for various types of plans; Planning standards and regulations – Spatial standards, performance standards and standards for utilities, URDPFI guidelines, development control regulations.

Unit IV Methods and Tools**9**

Analytical methods - linear programming, threshold analysis, simulation, rank size rule, scalogram, sociogram, cluster and factor analysis, delineation techniques, SWOT analysis; location models, gravity models.

Unit V Emerging and Future Trends**9**

Emerging school of thoughts and doctrines; Recent and contemporary contributions to the changing planning paradigms; Planning for future and in future - vision development, strategising, Implementation of planning policies and development plans.

Total: 45 Periods**Outcomes:**

- Application of relevant planning theories and concepts in urban and regional planning

References:

- C S Bertuglia, G. Leonardi, (eds) (2018). Urban Systems: Contemporary Approaches to Modelling. Routledge, London.

2. Richard E. Klosterman, Kerry Brooks, Joshua Drucker, Edward Feser, Henry Renski (2018). Planning Support Methods: Urban and Regional Analysis and Projection. Rowman & Littlefield Publishers.
3. Wang, Xinhao & Hofe, Rainer (2007). Research Methods in Urban and Regional Planning. Springer-Verlag Berlin Heidelberg. Tsinghua University Press.
4. Philip Allmendinger (2017). Planning Theory. Macmillan Education Publications.

MPIS113 - Data Analytics and Techniques in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To acquire proficiency in quantitative techniques and computing tools that are applicable in planning domain to conduct empirical studies.

Unit I Data sources and surveys in Planning 9

Types of data, data aggregation, units of measurement, standard notation; coding and decoding methods, tabulation and graphical presentation of data; Introducing web-based information portals and datasets as raw information sources; Elementary association models and decision making; Index Numbers (weighted and unweighted); Application of index number in spatial planning; Calculation techniques of vital events; Quantitative and qualitative data collection methods; Validity and reliability of data; Questionnaire design and typology; measurement scales and their applications; Sampling techniques, sample size calculations.

Unit II Introduction to Statistical Methods for Planning 9

Descriptive statistics (Frequency distribution; Measures of central tendency; Measures of dispersion); Introduction to probability; normal and standard normal distribution; Tests of hypothesis- type I & II errors, one-tailed and two tailed tests, chi-square test, student T test.

Unit III Correlation and Regression 9

Correlation – scatter plot diagrams, correlation coefficients; Least square method; Assumptions of regression analysis, linear regression, multiple regressions; Dummy variables; Functional forms; Binary dependent variables; Instrument variables; Time series analysis;

Unit IV Spatial Data and Geographic Information Systems 9

Definitions – Geoinformatics, Remote Sensing, Geographic Information Systems (GIS), the concept of earth surface projections; the need for GIS, Spatial Data Infrastructure; accuracy and precision, raster and vector data, spatial thematic models, Components of a GIS; spatial and attribute data- input and output; spatial data entry- data structure for GIS, vector data structures; Coordinate systems; Geodetic data - point positioning, problems, measurements, spatial analysis using lab modules, etc.

Unit V Planning Techniques 9

Maps as a representation of reality, Elements of Maps; Graphical, linear and areal scales, Notations involving basic discipline of maps; Measurement of areas; Data creation and query; Map preparation – Geo-referencing, digitization, scales, layers, layout, topology creation, spatial data analysis - buffer, overlay and multi criteria decision modelling, Hotspot analysis.

Note: Examples from spatial planning to be applied in each unit using softwares like QGIS, ArcGIS, Geoda, Spreadsheets, SPSS, etc.

Total: 45 Periods

Outcomes:

- Proficiency in using statistical and planning techniques in urban and regional planning

References:

1. Agarwal B L (2007), Programmed Statistics. New Age International Publishers, New Delhi.
2. Alan C. Acock (2012), A Gentle Introduction to STATA. Revised Third Edition.
3. Gupta and Gupta (2012), Business Statistics. Sultan Chand and Sons, Delhi.
4. Wooldridge (2011), Introductory Econometrics: A Modern Approach. Thomson Press, Noida.
5. Gujarati, D.N. and Porter, D.C., 2009. *Basic econometrics*. McGraw-hill.
6. Sachithanandan (2004), Reading material on Planning Techniques, Institute of Town Planners India, New Delhi.

MPIS114 - Habitat and Environmental Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To give insights on global and local issues of environmental concern and introduce fundamental concepts and policies related to housing.

Unit I Components of Nature and Ecology**9**

Meaning and components of nature; Basic concepts of ecology, process of flow of material, water, energy, invasion, succession, perdition, regulatory forces, adaptation, tropic levels, food chains, food web, ecological pyramids; Ecology and their relevance to planning; Modifications in natural environment, causes and consequences.

Unit II Global & Local Concerns for Environment**9**

Evolution of human settlements; Civilizations and impact on environment; Contemporary environmental discourse; Green agenda and brown agenda; Global environmental movement; Environment and poverty; Environmental management and environmental planning; Global warming, climate change; Biological diversity; Brunt land's Commission's Report; Agenda 21; Club of Rome Report; UNEP charters.

Unit III Environmental Resources: Consumption, Conservation and Recycling**9**

Environmental resources and ecosystem services; Concepts of natural reserves; Consumption, conservation and recycling of resources; India's environmental programmes; Government of India's policies relating to forest, wildlife, hill, water resources, wastelands, hills, coastlines, oceans, etc.; local climatic zones; vulnerability analysis, Climate Smart Cities and Sustainable Framework.

Unit IV Housing and Built Environment**9**

Significance of housing in national development goals; Housing as a basic entitlement - core issues of housing, factors affecting residential location, theoretical knowledge of ecological, neo-classical, institutional approach to housing; estimating housing shortage, housing need, current methods of demand assessment, typologies of housing, housing norms; Densities and standards; Urban sprawl and environmental damages; Gender based planning of neighbourhoods and human settlements.

Unit V Housing Sectors, Acts and Policies**9**

Affordable Housing; Housing for the low-income groups – slums and squatter settlements, investment in housing in public and private sectors; Cooperative housing, objectives and principles, management and financing of housing projects; Acts, policies and programmes; Comparative policy analysis.

Total: 45 Periods**Outcomes:**

- Understanding of the housing issues and environmental concerns in settlement planning

References:

- Thomas L. Daniels (2014). The Environmental Planning Handbook for Sustainable Communities and Regions. Planners Press, American Planning Association.
- Jetske A. Bouma, Pieter J. H. van Beukering (2015). Ecosystem Services: From Concept to Practice. Cambridge University Press.
- Van Bortel, Gerard, Vincent Gruis, Joost Nieuwenhuijzen & Ben Pluijmers, (Ed.) (2018), Affordable Housing Governance and Finance: Innovations, partnerships and comparative perspectives. Routledge, London.
- Nicholas Dagen Bloom, Lawrence Vale (2015). Public Housing Myths: Perception, Reality, and Social Policy. Cornell University Press

MPIS115 - Infrastructure Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To develop skill sets pertaining to provision of physical and social infrastructure services in urban and regional planning.

Unit I Introduction to Infrastructure Planning**9**

Importance of infrastructure, objectives of the utilities, services planning and implications on public health and environment; Role of physical planner in planning of utilities and services; Role of line agencies in municipal areas; jurisdiction and scope of work of line agencies; Resilient Infrastructure, Smart cities and its infrastructure.

Unit II Physical Infrastructure**9**

Water and Waste Water Scheme, Layouts of distribution system; IUWM, Water and Waste water treatment methods, Low-cost sanitation methods and storm water drains; Zero discharge systems; Integrated Solid Waste Management; MSWM 2000. Environmental Policy 2006; Urban Energy Systems and Civic services. Service Level Benchmarks.

Unit III Social and Economic Infrastructure**9**

Types of social infrastructure; Health care - essential service, availability, access and utilisation, standards, public and private institutions, policies, National Rural Healthcare Mission, hierarchy of health care establishments; Education - primary and secondary educational institutions, standards, policies, right to education (RTE); Public and community spaces – recreational, safety and security; Distributional services, Economic Infrastructure.

Unit IV Transportation and Land use Integration**9**

Introduction to transport and travel; Understanding travel from the mobility, economic, social-psychologist, time/space perspective; Factors affecting land use-transport integration, and tools for land use and transport integration, land use transport cycle, importance of accessibility, Transportation planning process; Introduction to four stage modelling; Demand and supply of transport; Congestion pricing; Transport Pricing, Basic transport economic model; SLBs; Introduction to carbon footprint.

Unit V Formulation of DPR for Infrastructure Services**9**

DPR and its importance; contents of DPR; broad sequences to DPR formulation; capabilities required to prepare a DPR; DPR evaluation, Project Cost, Institution Framework, Project Financial Structuring, Project Phasing, Project O&M planning, Project Financial Viability & Sustainability .

Total: 45 Periods**Outcome:**

- Knowledge and skillsets on planning for infrastructure services at urban, rural and regional level.

References:

- Dinesh M, Omer T, Michael S, Michael J, (2009), Road safety in India: challenges and opportunities. University of Michigan, Transport Research Institute.
- Government of India, (2010), Service level benchmarks for urban transport. Ministry of Urban Development. http://urbanindia.nic.in/programme/ut/Service_level.pdf
- Jaun de Dios Ortuzar, Luis G. Willumsen, Wiley, (2011), Modelling Transport (4th Edition), Routledge.
- Jean-Paul Rorigue, Claude Comtois, Brian Slack, (2006), *The geography of transport systems*. Routledge

MPIS116 - Socio-Economic Dimensions in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To provide an understanding of the society and the economy of the nation and its importance in spatial planning.

Unit I Introduction to Sociology**9**

Definition and scope of sociology; Concepts-society, social systems, social structure, institution and organisation; Understanding society- theories and methods; Sociology and planning, Planning and Sociology; Man – Environment relations and traditional spatial planning practices; Need for Demographic studies.

Unit II Social Groups, Social Issues, Rural and Urban Sociology**9**

Social groups, social stratification, social exclusion and social inclusion; Agrarian, industrial and modern society and spatial formation; Linking social structure and physical structure of village and urban settlements; Sociology of formal and informal settlements in cities and towns; sustainable society and liveable neighbourhoods; making of smart homes, communities and neighbourhoods.

Unit III Demography and Planning**9**

Traditional and modern theories of population, population dynamics, Population patterns in India and the World; Distribution & structure of population, Population change causes & implications, demographic characteristics of population and their measures, population growth and development, natural growth and migration of population. Basics of population studies, source of demographic data, population structure and composition – age sex composition, sex ratio, dependency ratio, child-woman ratio; Measures of age–sex structure, age–sex pyramid. population projections, cohort analysis;

Unit IV Applied Economics**9**

Definition of economics - fundamental economic principles and concepts related to urban and regional planning; Basics of macro, meso and microeconomics, law of demand and supply- its relevance in planning; Goods, Market, factors of production; Economic concepts of land; Economic rent, land values, market mechanism and land use pattern. Employment mobility and analysis of distribution vis-a-vis place of residence; Economic base theory and techniques; economic development and growth indicators; economic growth vs development.

Unit V Socio-Economic aspects of Physical Planning**9**

Social mix and Urban neighbourhood Planning, communities and neighbourhoods, employment, housing and land use transformation; Urban rich, middle and poor and socio-spatial mobility; Children youth, women, aged and differently abled people and spatial planning; Social and economic Auditing and Social and economic Impact Assessment and urban development. Disaster, Resilience, climate change and socio-economic relevance of physical planning.

Total: 45 Periods**Outcome:**

- Exposure to concepts, theory and issues relating to socio-economic aspects in urban and regional planning

References:

1. Benjamin S (2008), Occupancy Urbanism: Radicalizing Politics and Economy beyond Policy and Programs, International Journal of Urban and Regional Research, Vol. 32.3, September, 719-729.
2. Brenner N and Theodor N (2002), Cities and Geographies of "Actually Existing Neoliberalism", Antipode, Vol. 34, Issue 3, 349-379.
3. De Souza M (2010), Which Right to Which City? In Defense of Political- Strategic Clarity. Interface, Vol. 2(1), May, 315-333.
4. Jan L, Christopher M. (2012), The Urban Sociology Reader. Routledge, London.

Second Semester

MURP121 - Urban Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorials Periods per Week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objective:

- This studio provides exposure to urban planning and enables students to understand the context, urban complexities, situations and emerging issues.

The studio focuses on urban areas of different scales ranging from small towns to metropolitan cities. The exercise enables students to comprehend the issues related to the identified urban area, undertake a relevant literature review, conduct field studies and surveys, and assess the native characters reflecting the Traditional Knowledge Systems. Prepare land use plans, analyse sectors and propose interventions. These may include preparation of sustainable development plans, sector specific plans, DPRs and formulation of strategies by integrating environmental aspects.

Total: 225 Periods

Outcome:

- Basic knowledge and skillset to prepare spatial plans for urban areas
- Capability to prepare comprehensive development plan/ sector-specific plans for the projected plan period

References:

1. Deutsche Gesellschaft fur Internationale Zusammenarbeit (2012), Land use Planning; Concepts, Tools and Applications. BMZ, Federal. Ministry for Economic Co-operation and Development, Germany.
2. Eisner Simon (1968), Concepts for Preparation of Land use Plan for Planning Units, Simon Eisner and Associates Publications, California.
3. Government of India (Ministry of Housing and Urban Poverty Alleviation) (2011), Report of the Working Group on Urban Strategic Planning Steering Committee on Urban Development and Management. New Delhi.
4. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Vol. 1, Ministry of Urban Development, New Delhi.

MURP122 – Geomatics and Analytics in Planning	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objectives:

- To equip with the concepts of geo-informatics and computing skills in the relevant software, associated scientific tools, and their relevance and applicability in urban and regional planning.

Unit I Basic Spatial Statistics**9**

Data exploration and spatial statistics for urban areas, evaluation, description and representation of spatial data quality, effect of inaccuracy on spatial data analysis. effect of data aggregation and disaggregation, MAUP (Modifiable Areal Unit Problem), Integration of spatial data of different quality Map matching. 3D volumetric analysis and modelling; Condition assessment of specific areas, Quantitative measurement of landscape surfaces; Vulnerability mapping and Monitoring.

Unit II Advanced Statistics**9**

Point pattern analysis: Point Sets and Distance Statistics, Nearest neighbour methods Hotspot and cluster analysis; Spatial autocorrelation and Spatial regression for urban phenomena; multi-criteria decision-making tools, land suitability analysis, Factor analysis; Cluster analysis

Unit III Application of Remote Sensing in Planning**9**

Digital images – satellite and aerial photography, resolutions, geo-referencing, projections, image processing, LULC, Change detection, UHI, digital elevation models, and stereo data analysis.

Unit IV Network Analysis and Land Use Models**9**

Network analysis tools (vehicle routing problems, shortest path analysis, closest facility analysis, etc); Emerging and advanced technology - web-enabled GIS, GPS tracking and monitoring; Automating GIS Workflows with the model builder and advanced visualisations; Space Syntax analysis; Vulnerability mapping and Monitoring. Big data and application of simulation techniques and platforms like Agent-Based modelling, ANN - Matlab, Cellular automaton concepts - MOLUSCE and System Dynamics approach.

Unit V Emerging Geo-Spatial Technology and Data**9**

Mobile geo-spatial data collection, cadastral and aerial mobile mapping, emergency response planning; Introduction to Google earth engine; Framework of geo-spatial data, interactively connected users and tools, Agreements on geo-spatial standards, Policies to facilitate data capturing, access to geo-spatial data, data driven approach, Institutional arrangements, Use of SDI to communicate spatial data, issues, guidance and services for urban and regional planning; Integrating virtual, augmented, mixed reality simulation technologies in Planning.

Total: 45 Periods**Outcome:**

- Knowledge and skill set on application of geo-spatial techniques and related software in urban and regional planning

References:

1. Helen Briassoulis (2020), Analysis of Land Use Change: Theoretical and Modeling Approaches, University of the Aegean.
2. Anil K. Jamwal (2008), Remote Sensing and GIS, Jnanada Prakashan, Delhi.
3. Cambell, J.B. (2002), Introduction to Remote Sensing, Taylor & Francis, London.
4. Jan Van Sickle (2010), Basic GIS Coordinates, Second Edition, CRC Press; 2 Edition, NY.
5. Richards, J.A. and Xia, X. (2006), Remote Sensing Digital Image Analysis: An Introduction, Birkhauser, London.
6. O'Sullivan, David and David J. Unwin (2010), Geographic Information Analysis, 2nd Edition, John Wiley & Sons. s, Inc., Canada. ISBN-13: 9780470288573; ISBN-10: 0470288574
7. De Smith, Michael J., Paul A. Longley and Michael F. Goodchild (2013), Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software Tools, 4th Edition; Troubador Publishing Ltd ISBN-13: 9781905886609; ISBN-10: 1905886608

MURP123 - City and Metropolitan Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To introduce urban growth, systems, linkages between city and region, problems and issues of metro and mega cities and planning for the metropolitan areas.

Unit I Introduction

9

Historical evolution of metropolitan planning - historical development of metropolitan planning and its impact on current urban landscapes, global urbanization trends, and implications for metropolitan planning strategies. concept and approaches to metropolitan planning; theorising the city- chicago school, postmodern school, poststructuralist school; critical urban theory.

Unit II Metropolitan Regions

9

Delineation techniques of metropolitan areas; primate city; metro and mega cities-issues, processes and trend; urban culture.

Unit III Urban Rural Continuum

9

Urban sprawl and suburbanization; core-periphery; urban sprawl projections. global city and city regions; urban agglomeration and peri urban development, urban and rural transformation.

Unit IV Urban Economy

9

Urban economies; cities as growth engines; economic restructuring: the post 1973 world; neoliberalism; globalisation and cross border trade practices; gentrification and the revanchist city; public space and right to the city.

Unit V Metropolitan Planning in Contemporary Practices and Global Strategies

9

Defining sustainability and sustainable development, Sustainable Development Goals (SDGs), Millennium Development Goals (MDG's), contemporary approaches in metropolitan regions, multidimensional poverty indexes; urban physics and its implications on metropolitan planning. different innovative cluster approaches; introduction to sustainable cities, green cities, smart cities, digital, intelligent cities and resilient cities etc.

Total: 45 Periods

Outcome:

- Knowledge on cities, city sub-systems, regions, and their governance to promote sustainable development by keeping the urban economy as a catalyst.

References:

1. Karsten Zimmermann, Daniel Galland, John Harrison (2020), Metropolitan Regions, Planning and Governance.
2. Leckrone, J. Wesley. 2006. Metropolitan Planning Organizations, Federalism in America: An Encyclopedia.
3. Brenner, Neil; Marcuse, Peter; Mayer, Margit, (2011), Cities for People, Not for Profit: Critical Urban Theory and the Right to the City, Routledge, NY.
4. Bruegmann, Robert (2005), Sprawl- A Compact History, University of Chicago Press Books.
5. Harvey David (1973), Social Justice and the City, Baltimore, Johns Hopkins University Press.
6. Sassen Saskia (2012), Cities in a World Economy, 4th ed. Thousand Oaks, CA: Pine Forge Press. London.

MURP124 - Land Economics and Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To provide students with an overview of the land economics to spatial planning and issues.

Unit I Land as a Resource 9

Land as natural, economic, finite and productive resource; concern for land; concepts of land resource management; land development models.

Unit II Land as a Fiscal Tool 9

Transit-oriented development and town planning schemes; concepts of land rent, welfare economics and principles, land values, rents, levy of development charges, betterment fees, property taxation, economic restructuring and market mechanisms which influences/regulates the urban land use.

Unit III Valuation of Property & Development Charges 9

Valuation of property – principles and practices; private ownership and social control of land; disposal of land, land development charges and betterment levy; land use regulations, RERA, compensation and requisition taxation of capital gain on land versus public ownerships, economic aspects of land policies at various levels of decision making, land development potential analysis.

Unit IV Land Value Capture Mechanism 9

Changing land values in urbanized and urbanizing areas; land value capture taxes; land markets – legal and illegal in the core and fringe areas of metropolitan cities; property markets.

Unit V Cost Benefit Analysis & Case Studies 9

Process – CBA, discount rate, net present value, sensitivity analysis, valuation, risk and uncertainty, case studies

Total: 45 Periods

Outcome:

- Knowledge and ability to understand the importance of land and its management in settlement planning.

References:

1. Josh Ryan-Collins, Toby Lloyd, Laurie Macfarlane & John Muellbauer (2017), Rethinking the Economics of Land and Housing
2. Government of India (Directorate of Income Tax, Ministry of Finance) (2009), Guidelines for Valuation of Immovable Properties, Directorate of Income-Tax (PR, PP & OL) Mayur Bhawan, New Delhi.
3. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2007), Model Guidelines for Urban Land Policy, New Delhi.
4. Shirley Ballaney and Bimal Patel, (2009), Using the 'Development Plan – Town Planning Scheme, Mechanism to Appropriate Land and Build Urban Infrastructure, India Infrastructure Report, 3iNetwork, IDFC, Oxford University Press, New Delhi.
5. Vidyadhar K. Phatak (2013), Land Based Fiscal Tools and Practices for Generating Additional Financial Resources, Ministry of Urban Development, GOI & the World Bank.
http://jnurm.nic.in/wp-content/uploads/2014/09/Final-Report-LBFT_28Aug2014.pdf.

MURP125 - Planning Legislation and Governance.	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: The course discusses the evolution of planning legislations, legislative implementation mechanisms and governance arrangements in the Indian context; producing equitable, inclusive, and sustainable urban environments through institutional framework and implementation mechanisms towards sustainable governance.

Unit I Legislation Framework, Government & Governance System In India

9

Evolution of planning legislation and overview; Concept of Law; Sources of law (custom, legislation and precedent); meaning of the term of law, legislation, ordinance, bill act, regulations and bye-laws; significance of law and its constitutional relationship to urban planning. Definition, concepts and types of administrative divisions and notified planning boundaries of India, Features of the constitution of India, Democracy and Government, 73rd & 74th Constitutional Amendments; Decentralized governance system in India, urban and regional governance.

Unit II Participatory Municipal Governance

9

Municipal infrastructure service delivery system of water, health, sanitation, security and poverty reduction - Spatial Access, Inclusion of infrastructure in informal settlements and Urban local govt case studies. Legislations relating to urban art commissions; Co-operative Societies Acts; PIL etc Special Purpose legislations viz; Special Economic Zones (SEZ); Special Investment Region (SIR); National Data Sharing and Accessibility Policy-2012 (NDSAP-2012); Spatial Data Infrastructure (SDI) Act; Democracy and participatory governance, public participation theories, Information communication system and local government – Public Relations and Local Government; Good Governance index and indicators; collaborative and sustainable governance.

Unit III Legislation Related to Use & Control of Land

9

Introduction to Land Acquisition Act, 1894; Land Acquisition, Rehabilitation and Resettlement Act, 2013; Judicial precedents; Legislations controlling the change of land use and development for non-agricultural purposes, Urban Land (Ceiling and Regulation) Act, 1976 and repeal; development control regulations and building byelaws, sub-division regulations, fire and airport regulations; special regulations, accommodation Reservation; Rent Control Acts; Apartment Ownership Acts; Contract Act; Transfer of Property Act; The estate duty Act; Easements Act; Slum improvements and clearance Acts.

Unit IV Environmental legislations

9

Environmentalism; Evolution of environmental laws in India; Law of Torts, National Environmental Policy – Pollution control acts – air, water and environmental protection acts, EIA notification, Forest and wildlife act; other important international environmental laws, NGT, archaeological sites and remains of national importance; CRZ notification, MoEFCC guidelines and notifications.

Unit V Governance and e-Governance

9

Meaning and form of e-Governance at national and international experiences in rural and urban areas – institutional and organization change – e-Governance system, e-service and e-participation, m-governance, e-Readiness of local government, e-Governance for villages, districts, towns and smart cities in India and abroad.

Total: 45 Periods

Outcome:

- Knowledge on urban and regional legislations and governance and its constitutional relevance to urban and regional planning in the Indian context.

References:

1. Uttam Chand Shah (2023), Planning Legislation Covering Urban & Regional Planning and Environmental Laws in India.
2. Basu, Durga Das (2013), Introduction to the Constitution of India, LexisNexis Butterworths Wadhwa Nagpur, India.
3. Gol (Government of India, Ministry of Urban Development), JNNURM, Implementation of 74th Amendment and Integration of City Planning and Delivery Functions, State Level Reform. http://jnnurm.nic.in/wp-content/uploads/2011/01/Mandatory_Primer_1-2-Implementation_CAA_Planning.pdf
4. Mathias Finger and Sultana (Eds.) (2012), e-Governance a Global Journey, Global Publications. London.
5. Mohamed Abdul Razak (2011), e-Governance Vs. e-Readiness in Urban Municipal Governments in Tamil Nadu, India. In Piaggeri, Americas, Sand & Castelnovo (Eds.), Global Strategy and Practice of e-Governance, Examples around the World, Global Publications, London.

MURP1210 - Inclusive Planning	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide exposure to the emerging concepts and issues concerning inclusive community approaches in planning. To include the disadvantaged, marginalized and other vulnerable sections/groups into the main stream of planning.

Unit I Elements of Inclusivity

9

Definition, concepts, elements of inclusivity; Exclusion and related issues, disparities, social fragmentation, existing divisiveness; Marginalization, exclusion and access to services

Unit II Community Planning

9

Definition, concepts and methods; database creation for inclusive planning / community development through community participation and management; community mapping, language and discourse in planning, interactive planning, multi-directional flows in decision-making, communicative rationality and democratic processes, building consensus in planning

Unit III Poverty, Informal Sector & Inequality

9

Definition, dimensions, deprivation, measurement, defining parameters; absolute and relative poverty; Informal Sector – Definition and dimensions; migratory impulses and their association with growth of informal sector; Role of informal sector in housing; Housing and basic needs - lack of essential infrastructure; poor condition of existing services.

Unit IV Disparities and Equal Opportunities

9

Critique of neo-liberalism; power and hegemony; forms of marginalization; right to the city approach; feminist planning theory; Caste and religion –planning and designing for the differently-able persons, elderly, children, and pregnant women;

Unit IV Policies Programs, Model related to Inclusive planning

9

Planning legislation and related programmes; Management for the vulnerable sections; Formal institutions of inclusion and community; Role of central and state governments; Private and voluntary organizations; Development indicators; People-centric and participatory planning; bottom-up approaches; Incremental approach; Low cost alternatives and institutional reforms approach; Public-private partnership; PRA techniques and participatory GIS;

Total: 45 Periods

Outcome:

- Knowledge on integrated community planning approaches and tools for inclusive planning

References:

- Ali Sabir (2006), Dimensions of Urban Poverty, Rawat Publications, the University of Michigan.
- Brown A and Kristiansen A. (2009), Urban Policies and the Right to the City: Rights, Responsibilities and Citizenship; UNESCO, UN-Habitat Publication.
- Kundu, Amitabh and Sharma, Alakh N (2001), Informal Sector in India: Perspectives and Policies, Institute for Human Development & Institute of Applied Manpower Research, the University of Michigan.
- Singh R.U., Thakur A.K. (2009), Inclusive Growth In India, Deep & Deep Publications Pvt. Ltd., New Delhi.

MURP1211 - Social Impact Assessment and Rehabilitation Planning	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- Aims to equip students with essential knowledge and skills in land acquisition, relocation, rehabilitation, social impact assessment, enabling them to contribute effectively to urban planning and sustainable development initiatives.

Unit I Land Acquisition, Relocation and Rehabilitation**9**

Land conflicts, land classification, land rights and governance, how land conflicts delay development projects, Legal, Policy and Regulatory Framework; Better understanding of SIA process as per the Land Acquisition, Rehabilitation and Resettlement Act, 2013, Fair Compensation and Transparency in Land Acquisition, DFDR Issues & Complexities; Sustainable Resettlement.

Unit II Impact of Relocation and Rehabilitation**9**

Compensation, income restoration and relocation; Terms of Reference (ToR), Preparation of land acquisition plan, Asset evaluation (movable and immovable property), Estimation of compensation and R&R package, Development of entitlement framework, budgeting and grievance redress; Learning from case studies – Relocation and rehabilitation of non-title holder. Estimation of intangible losses; Learning from case studies – management of Common Property Resources (CPR)

Unit III Social Impact Assessment (SIA)**9**

Framework for Measuring Impact, Theory of Change, Breadth of Impact, Depth of Impact, Target Population identification, Philosophies Guiding Social Impact Analysis, Why Measuring Social Impact Matters, current and future approaches to impact measurement and data collection, Tools and instruments for conducting SIA surveys, Filling the Socio-Economic survey questionnaire, collation and interpretation of data, Categorization of impact and determining its significance;

Unit IV Social Media Analysis**9**

Collecting and extracting social media data, use of data collection APIs, analysis of structured and unstructured data; sentiment analysis; Case example.

Unit V Case Studies and Application of Techniques In SIA**9**

SIA content analysis, case studies, strategies for describing qualitative data, Literature critique, Focus group data analysis, Stakeholder consultation techniques, Citizen Science Approach, Opinion analysis techniques like AHP, Delphi, etc., Concept Mapping, The Card Sorting Activity in SIA.

Total: 45 Periods**Outcome:**

- Navigate legal, policy, and regulatory complexities in land acquisition, while mastering methodologies for conducting social impact assessments and qualitative data analysis, fostering sustainable urban development.

References:

1. Burdge, Rabel J. (2003) The practice of social impact assessment background, *Impact Assessment and Project Appraisal*, 21:2, 84-88, DOI: 10.3152/147154603781766356
2. Esteves, A.M., D. Franks, and F. Vanclay. (2012). Social Impact Assessment: the state of the art, *Impact Assessment and Project Appraisal*, 30:1, 34—42, DOI: 10.1080/14615517.2012.660356
3. Mathur, H.M. (ed.) *Assessing the Social Impact of Development Projects: Experience in India and other developing countries*. Springer 2015.
4. World Bank. (2004). *Involuntary Resettlement Sourcebook: Planning and Implementation in Development Projects*. Washington DC: World Bank
5. Frank Vanclay and H.A. Becker. (2003). *The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances*. Cheltenham, UK: Edward Elgar Publishing Ltd.
6. *Right to Fair Compensation and Transparency in Land Acquisition, Resettlement and Rehabilitation Act, 2013*
7. SIA Rules of the Government of India and various state governments

MURP1212 - Smart Cities	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To provide exposure to the emerging concepts and issues concerning future smart cities.

Unit I: Urban Evolution and Intelligent Systems 9

City branding initiatives: Sustainable cities, eco-cities, green cities, digital cities, intelligent cities, future cities, global cities, and smart cities, Future Cities and Smart City discourses in the USA, Europe, and the Gulf States, Application of the main themes of smart cities globally, Sensible cities, Intelligent systems and their role in urban development.

Unit II Smart Cities: Components and Concepts 9

Components and various dimensions of a smart city: Smart economy, smart mobility, smart environment, smart people, smart living, and smart governance, Smart city capitals and various forms of capital; Physical, human, social, intellectual, Smart energy systems; Integration of energy efficiency in urban planning; renewable energy and energy-efficient technologies.

Unit III Social Dynamics in Smart Cities 9

Social Processes as agents of change in city and society, the role of smart people, living, working, mobility, public facilities, open data, role of ICTs in developing smart cities, criticisms and challenges for implementing smart city concepts.

Unit IV Smart Urbanism 9

Urban reforms and Smart city initiatives, Smart city mission, latest developments relating to smart cities in India and global context, budgetary allocations, urban reform policies and capacity building initiatives by the government of India; Schemes, policies and best practices.

Unit V Measuring Smartness and Global Insights 9

Toolkits, indexes, and frameworks developed to measure smartness in Indian and global contexts; urban information systems and their role in city planning and management for smart cities; case studies in Indian and global contexts.

Total: 45 Periods

Outcome:

- Capability to formulate plans and proposals to achieve sustainable smart cities

References:

1. Samuel D. Simpson (2023), The Future of Smart Cities.
2. Ravi Srinivasan, Tamim Sookoor, and Sabina Jeschke (2017), Smart Cities: Foundations, Principles, and Applications. Houbing Song. Wiley Blackwell Publications.
3. Alex David Singleton, Seth Spielman, David Folch (2018), Urban Analytics (Spatial Analytics and GIS). Sage Publications.
4. Schahram Dustdar, Stefan Nastić, Ognjen Šćekić (2017). Smart Cities: The Internet of Things, People and Systems. Springer Publications.
5. Maria Sashinskaya (2015). Smart Cities in Europe: Open Data in a Smart Mobility Context. Create space Independent Publishers.

MURP1213- Urban Renewal and Heritage Conservation	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- Comprehensive understanding of urban renewal, redevelopment and conservation equipping with the knowledge and skills to analyze, plan, and implement sustainable development projects in diverse urban contexts.

Unit I Foundations of Urban Design and Renewal

9

Understanding urban form and renewal, components and scope of urban design, historic development and principles, scale and relationship with architecture and planning.

Unit II Evolution and Morphology of Cities in Renewal Context

9

Historical evolution of cities, determinants of urban form and renewal, impact of topography and environment, city planning and design principles in renewal, case studies.

Unit III Land Development Models and Strategies for Renewal

9

Introduction to land development models, strategies for brownfield and greenfield renewal and redevelopment, environmental assessment and remediation, community engagement and sustainable design, infrastructure planning and provision.

Unit IV Heritage Conservation Planning Implementation Techniques

9

Process of Heritage Conservation: Heritage Value Assessment and Significance of Monuments; Identification of heritage sites, potential sites for conservation: Listing and Grading of Heritage Properties and their precincts (w.r.t International and National Approaches viz. UNESCO, World Heritage Cities, Cultural Landscapes, Guidelines by TCPO, INTACH, AMASR Act, National Monument Authority etc.)

Unit IV Urban Renewal and Conservation

Urban renewal and conservation of historic core areas, understanding its cultural, social and heritage value reflected on the built form; Historic overview of urban renewal, development strategies for regeneration of inner city areas, introduction to conservation, heritage concepts of historic zones and world heritage sites, importance of charters, archaeological acts, conservation acts and legislation, concepts and approaches to urban conservation, institutional framework for urban conservation and renewal strategies.

Total: 45 Periods

Outcome

- Students will be able identify key determinants of urban form and renewal, evaluate strategies and practices in urban renewal and redevelopment, and apply theoretical principles to real-world case studies to propose innovative solutions for contemporary urban challenges.

References:

1. Ray Perrault (2022), Urban Regeneration: Methods, Implementation and Management.,ISBN: 978-1-68507-558-3
2. Pablo Holwitt(2020), Urban Renewal in India: Accommodating People, Ideas and Lifeworlds in Mumbai's Redeveloping Chawls (Routledge Series on Urban South Asia).
3. Banister Fletcher (1996), A History of Architecture, Routledge.
4. Mark M. Jarzombek (2013), Architecture of First Societies: A Global Perspective, John Wiley Publications.
5. Robert E. Stipe, (Ed.) (2003), A Richer Heritage: Historic Preservation in the Twenty-First Century, Chapel Hill: University of North Carolina Press.

MURP1214- Systems Thinking and System Dynamics	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- This course will introduce students to systems thinking and system dynamics (SD) methodology, to model, simulate, analyse, understand and discuss complex issues. This course will introduce model-building with components of system dynamics: using CLDs and SFDs notations. Examples and scenarios will be drawn from various social, economic, environmental and ecological systems.

Unit I Introduction to Systems Thinking and System Dynamics 9

Introduction to Systems Thinking; Collections Versus Systems; Defining characteristics of systems; The Iceberg, A close look at the Systemic Behaviour; Looking for a sign: Loops and Labels; System's view in urban and Regional Planning; Formulation of dynamic problems; Introduction to System Dynamics; definition of System Dynamics; System Dynamics Theory; Principles of systems and cybernetics; Fundamental concepts within system thinking and system design; causality, Little's Law, feedback; Systems, Dynamics, and Sustainability.

Unit II Causal Loop Diagrams and Mental Models 9

Brief History of Theory of Change; Theory of Change Diagrams; Theory of Change approach; Evaluation; Policy; Logic models; Log frame; The Process of Modelling: From Mental Models to Simulation Models; Reference Mode Diagrams; Pattern-Oriented Modelling; Group Model Building; Hamster Population model; Brief History of Causal Loop Diagrams; Causal Loop Diagram and basic elements; Creation-Process of Causal Loop Diagrams; Commons Issues and 'Tricks of the Trade'; Benefits of Causal Loop Diagrams.

Unit III System Structures and System Archetypes 9

Systems Thinking Tools; Brainstorming Tools; Dynamic Thinking Tools; Structural Thinking Tools; Computer-based Tools; Systems Archetypes; Drifting goals; Escalation; Fixes that Fail; Growth and underinvestment; Limits to Success; Shifting the Burden/Addiction; Success to the Successful; Tragedy of the Commons; Balancing Loop with delays.

UNIT IV The System Dynamics Modelling 9

System Dynamics Method; Owing to its Use In The Club of Rome Commissioned Report, Limits To Growth (1972); Dynamics of Economic and Population Growth Within the Constraints of the Natural World; Power of System Dynamics and Modelling, Both As Analytic And Thinking Tools; Problem Definition; Model Conceptualisation; Model Formulation; A Stock And Flow Diagram And System Dynamics Model; Model Verification And Validation; Example; Validation And Simulation; Developing Different Alternative Policy Scenarios Under Various Conditions; Analysis And Interpretation Of The System Dynamics Model.

UNIT V Communication Using System Dynamics Models 9

Development Of Governing Equations And The Solution Of Governing Equations; Development Of Governing Equations By Methods Appropriate To Each Subfield; Unifying System Level Analysis; Via Time Domain Solutions, Frequency (Laplace Domain) Solutions, And Numerical Simulation In Simulink For Model-Based Design (A Modern System Simulation Tool); Model-Based Design; Examples And Scenarios Will Be Drawn From Various Social, Economic, Environmental And Ecological Systems; Application/ Communication Of SD Models

Total: 45 Periods

Outcome

- Students will be able to comprehensively solve complex system problems by understanding their nonlinear behaviour over time, utilizing stocks, flows, feedback loops, functions, and time delays. They will also be able to apply systems-thinking frameworks and causal-loop diagram archetypes to construct and analyze systems-thinking problems.

References:

1. John Sterman, Business Dynamics: Systems Thinking and Modeling for a Complex World, McGraw-Hill (2000).
2. Craig W. Kirkwood, System Dynamics: A Quick Introduction, Arizona State University (1998) [Available online at: <http://www.public.asu.edu/~kirkwood/sysdyn/SDIntro/SDIntro.htm>]
3. Michael R. Goodman, Study Notes in System Dynamics, Pegasus Communication (1989)
4. Online learning material: <https://www.systemdynamics.org/distance-learning>

Third Semester

MURP211 - Regional Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objectives:

- This studio intends to facilitate students with the required knowledge and skills for preparing a regional plan, so as to achieve sustainable and harmonious development in the future; through a comprehensive understanding of its setting, context, linkages, legal frameworks and hierarchy.

The studio focuses on regional planning, which deals with different components, scales, and contexts of regions such as metro regions, resource regions, special regions and district planning. The exercise enables students to comprehend the issues related to the identified regions, and their links with higher and lower-order plans and also further assess the native characters reflecting the Traditional Knowledge Systems. It involves a comprehensive review of relevant literature, policies, frameworks, field studies, documentation, analysis and proposed interventions. These may include preparing sustainable regional plans, DPRs for selected sectors, and formulation of strategies.

Total: 225 Periods**Outcome:**

- Basic knowledge and skillset to formulate regional plans
- Capability to prepare sectoral proposals and policies

References:

1. Dewin G. Flittie (1970), The Delineation of a Region-an Alternative Technique, Journal of Growth and Change, Wiley Online Publications, Vol. 1, No.1, pages 34-38.
2. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Vol. 1, Ministry of Urban Development, New Delhi.
3. Misra R.P (2002), Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing Company, New Delhi.
4. Yupo Chan (2011), Locational Theory and Decision Analysis-Analytics of Spatial Information Technology, Springer Publications, Berlin.

MPIS 212 Research Methods	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To initiate the planning thesis by enabling students to identify a topic and then develop a proposal and methodology in detail besides providing them with the required theoretical inputs on the syllabus contents.

Unit I Introducing Research**9**

What is research? types of research, basics of academic and applied research; Different approaches to research; Research philosophies – positivist and phenomenological philosophies. Introduction to elements of research: grounded theory, epistemology, ontology, theoretical perspective, methods, methodology; Justification of choice and use of methods and methodology; Paradigms in research, Research Ethics

Unit II Developing Thesis**9**

Methodology: Identification of research problem; Research questions; Formulation of hypothesis; Writing aims, objectives, scope and limitations; Content development - Developing contextual background; Research design; Review of relevant literature; Quantitative – surveys, experimental, longitudinal, cross-sectional studies; Qualitative – case studies, action research, ethnography, participative enquiry, grounded theory. Identification of suitable research methods/ techniques/ instruments; Data collection – questionnaires, sampling techniques, observation, interviews; Analysis - qualitative and quantitative analysis, data synthesis; Research outcome –research findings, recommendation and conclusion.

Unit III Data Analytics in Research**9**

Data analytics; multi-variate data analysis; simulation and modelling techniques in urban planning- statistical, geo-spatial, mathematical, econometric, System Dynamics, network-based, agent-based modelling etc., by employing various software and analytical tools and hypothesis testing.

Unit IV Field Work Plan**9**

Survey format preparation, study area identification and map preparation; Work plan schedule.

Unit IV Research Communication**9**

Research vocabulary, reading – notes taking, material organisation, indexing; Technical writing – content synthesising, paraphrasing, citation and referencing; Academic writing – research proposal /synopsis, abstract writing, report writing and mapping; Presentation: effective oral communication – content structuring, voice modulation, body language, audio-visual aids, handouts.

Total: 45 Periods**Outcome:**

- Basic knowledge on research methods and techniques
- Capability to formulate research design and research proposal

References:

- Keith F. Punch (2013), Introduction to Social research: Qualitative and Quantitative Approaches. Sage Publications, London
- Crotty M. (2012), Introduction: The Research Process, the Foundations of Social Research, Meaning and Perspective in the Research Process. Sage Publications, New Delhi.
- Frankfort, Nachmias, C., & Nachmias, D. (2008), Research methods in the social sciences. 7th ed. New York: Worth
- Neville, Colin (2007), An Introduction to Research and Research Methods. Effective Learning Services, School of Management, University of Bradford

MURP213 - Rural Planning and Development	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide exposure to the concepts, initiatives, systems and trends of rural planning and development.

Unit I Introduction**9**

Concepts - village as an organic entity- the physical, social, economic, administrative structure of the village. Land use and land cover in rural areas. Social, economic and ecological constraints for rural development. Indian rural society, caste, class and gender structures, smart village, need for decentralized and integrated rural development planning and localisation of SDGs in rural development.

Unit II Rural Settlement Structure and Development**9**

Hierarchy of settlements in rural India, Rural development: concept, hierarchy and nature, approaches. Land reform system, Gramin swaraj, Sarvodaya movement, Five Year Plans and Rural Development; Planning process at National, State, Regional and District levels; Planning, development, implementing and monitoring organizations and agencies and RADPFI guidelines; Development initiatives and their convergence; Special component plan and sub-plan for the weaker; Database for local planning.

Unit III Rural Institutional Systems: PRIs and Participatory Planning**9**

73rd Constitution (Amendment) Act – XI schedule, Devolution, Decentralization, Process of empowerment and consensus orientation, Panchayati Raj institutions – organizational linkages; Various committee and their suggestion for PRI. District Administration – Evolution of District Administration, structure and functions, accountability of District level development Departments – Role of District Magistrate/District collector vis-à-vis various Departments' hierarchies. District planning and local planning.

Unit IV Resource-Based Rural Development**9**

Agricultural Policy and Food Security, irrigation and Watershed Management, agro-based industries, tourism development: agro and eco-tourism; Climate Change and its effects on the Rural Economy, Resource mapping, resource mobilization including social mobilization; Disasters and Resilience in rural areas.

Unit V Emerging trends: Rural Development**9**

Institutionalization; Information Technology and rural planning, marginalized sections and rural planning, rural marketing, rural finance, GPSDP, GDDP, Aspirational Districts Programme and contemporary approaches in rural development.

Total: 45 Periods**Outcome:**

- Rural systems, planning approaches and administration

References:

- Dutt.R, Sundaram.KPM (2008), Indian Economy, S Chand Publication, New Delhi.
- Macivier R .M and Page.C (1981), Society –An Introductory Analysis, Macmillan Pvt Ltd, India.
- Moseley, Malcolm J. (2003). Rural Development: Principles and Practice; SAGE Publications Pvt. Ltd, London.
- Singh.K (2009), Rural Development Principles, Policies and Management, SAGE Publications Pvt. Ltd., New Delhi.

MURP214 - Project Planning and Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To introduce aspects of project planning, management, implementation, monitoring and appraisal.

Unit I Introduction to Project Planning

9

Introduction to Projects, Project Classification, Nature of planning projects, Project life cycle, Methodology for project identification and formulation; Preliminary screening, Project Rating, Detailed project reports, and feasibility studies

Unit II Project Formulation and Appraisal

9

Projects and planning issues including sectoral policy at local, State, and National levels; Project appraisal; technical, financial, social, economic, environmental, Approaches of appraisal - World Bank and Asian Development Bank methods, institutional approaches, SCBA, UNIDO etc.

Unit III Project Management

9

Project characteristics; techniques of management, Importance of project management; PERT & CPM; new techniques of management by objective (MBO).

Unit IV Pre-implementation Planning Phase

9

Work-Break Down Structure; Network Analysis; CPM, PERT; Resource Levelling and Allocation; Time-Cost Trade Off Aspects. Hands on exercise using Project Management Software like MS Project, Primavera, etc.

Unit V Project Implementation, Monitoring and Evaluation

9

Project implementation, stages of implementation; actors in projects implementation; project monitoring; meaning objectives and significance; monitoring techniques; integrated reporting, milestones, time and cost over-run and under runs, unit index techniques; project evaluation; Techniques of project evaluation; Case studies in urban and regional planning projects.

Total: 45 Periods

Outcome:

- Capability to formulate, appraise and manage the projects related to spatial planning

References:

- Albert Lester (2007), Project Management, Planning and Control, Butterworth Heinemann Publishing House, United Kingdom.
- Harold R. Kerzner (2013), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, John Wiley & Sons, New Delhi.
- Jose Maria Delos Santos (2013), Project Management Absolute Beginner's Guide – A Book Review, QUE Publishing house, New Jersey.
- Ramakrishna K (2010), Essentials of Project Management, PHI Publishing house, New Delhi.

MURP215 - Disaster Preparedness and Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide an overview to disasters, critical understanding of the processes and stakeholder roles involved in reducing the impact of disasters on settlements.

Unit I Calamities and Disasters – Introduction

9

Concepts, and definitions of disaster, hazard, calamity, risk, vulnerability, resilience and adaptation; Types of Disasters - urban disasters, pandemics, complex emergency situations; Types of impacts - in terms of special groups, castes, class, gender, age, location, disability; Global trends in disasters; Disasters and biodiversity loss; socio economic aspects of disasters.

Unit II Cycle of Disaster Management

9

Stages of Disaster; Immediate Response, Rescue and Relief; Common Issues with Reconstruction and Rehabilitation; Safety, prevention, and preparedness measures; Mitigation measures, structural and non-structural measures; Role of different agencies in disaster management - Government, INGOs, NGOs and CBOs, role of economy, ecology and social networks in determining resilience.

Unit III Risk, Vulnerability and Coping Methods – Disasters in the context of Development

Understanding Risk through Livelihoods Analysis; Factors affecting Vulnerabilities; Differential Impacts of disasters; Ability to recover, coping methods, alternative adjustment processes; Relevance of indigenous knowledge, appropriate technology and local resources; Hazard and vulnerability profile of India; Disasters in the context of development projects, Land use change and adaptation to Climate Change,

Unit IV Role of SDI and Communities in Disaster Management

9

Information and data in the context of emergency situations: Role of geospatial tools in the field of disaster management; Community and disasters.

Unit IV Planning for Disaster Management

9

Steps for formulating a disaster risk reduction plan; Preparation of state and district disaster management plans; DM Act and Policy, Relevant policies, plans, programmes and legislation: Master plans, disaster preparedness and post disaster management.

Total: 45 Periods

Outcome:

- Knowledge on types of disasters, risks, vulnerability, coping methods and planning for disaster management in settlement planning.

References:

- Abarquez I. & Murshed Z (2004), Community Based Disaster Risk Management: Field Practitioner's Handbook. ADPC, Bangkok.
- Alexander D. (2000), Introduction in 'Confronting Catastrophe', Oxford University Press, London.
- Government of India (2005), Disaster Management Act 2005, Government of India, New Delhi.
- Government of India (Ministry of Home Affairs) (2004), National Disaster Response Plan (NDRP Report), New Delhi.

MURP2110 - Human Settlements and Climate Change	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To study human settlements in climate change perspective and understand strategies for adaptation and spatial planning tools for mitigation of GHG emissions.

Unit I Introduction to Climate Change

9

Concern, human settlements as a major source of emissions, vulnerability to impacts of climate change, emission paths, strategies, location of settlements, socio-economic characteristics, cultural practices and governance structure, suitable interventions

Unit2 Climate Risk and Vulnerability in the City

9

Risk due to climate change, risk assessment, impacts due to flooding, cyclones and landslides, impacts on infrastructure, urban governance and participation

Unit3 Urban GHG Emissions

9

Sectoral emission – residential, industrial, transport, waste disposal, reducing emissions and urban carbon footprints, carbon trading and other alternatives

Unit4 Climate Change Mitigation and Low-Carbon Cities

9

Energy efficient approaches, Urban climate governance, transportation and energy systems for the future, land-use planning and compact cities, future and smart cities, reducing the urban heat islands, protecting urban water systems from climate change risks

Unit5 Adaptation – Towards Climate Resilient Cities

9

Includes climate change adaptation – migration as adaptation, climate change experiments and alternatives, Climate change, Vulnerable Regions and Groups – Tropics, farmers, gender, children, poor and migrants

Total: 45 Periods

Outcome:

- Estimating urban GHG emissions, risk assessment, vulnerability and adaptation to climate change

References:

- Harriet Bulkeley (2013), Cities and Climate Change, (Routledge Critical Introductions to Urbanism and the City), Routledge, New York.
- Lehmann S (2015), Low Carbon Cities- Transforming Urban Systems, Routledge Publications, New York.
- Nikolas Bader and Raimund Bleischwitz (2009) Measuring Urban Greenhouse Gas Emissions: The Challenge of Comparability, Cities and Climate Change, Vol. 2 (3).
- P.Neeraj et al (2008), Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters, World Bank Publications.

MURP2111 - Special Area Planning	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To equip the students with the knowledge of addressing issues of urgent concern. The syllabus focuses on preparation of special area plan with an emphasis on the coastal / port areas.

Unit I Introduction

9

Concepts and components of special area planning; Composition of land uses of special area plan versus conventional land use theories; The practice related to the activities of government, N.G.O and related to local area planning.

Unit II Urbanization and Growth

9

Urbanisation trends, development and redevelopment activities; illustrative framework to guide and regulate the development fostering economic growth; growth factors and compatible land uses; Corridor development, industrial, coastal corridors

Unit III Special Area Plans

9

Key challenges, design considerations, site characteristics and functionality of a space which become base/guide for site planning and land use regulations and development control rules; Hill area plans, Corridor plans, Special investment region and special economic zones, coastal area planning, Port area planning and logistic hubs.

Unit IV Policies

9

Land use plans and development control regulations to ensure comprehensive development; Improving the quality of life and socio-economic growth of a specified area; Changes in the policies, land use regulations and emergence of growth factors result in significant change in the land use and growth patterns.

Unit IV Case Studies

9

Socio-economic-environmental, profile—multiple agencies and complex boundaries; review of development projects and its socio-economic-environmental impacts; Coastal area/port cities, planning and governance; healthy urban planning and healthy cities.

Total: 45 Periods

Outcome:

- Delineation of special areas, ability to carry out studies and develop comprehensive proposals.

References:

- Kulshreshtha, S.K. (2012) Urban and Regional Planning in India - A Handbook for Professional Practice. SAGE Publications India Private limited, New Delhi.
- Mookiah Soundarapandia (Ed.) (2012), Development of Special Economic Zones in India: Impact and implications, Vol.2, Concept Publishing Company Pvt. Ltd., New Delhi.
- Municipal Corporation of Delhi (2011), Redevelopment Plan/ Scheme of Special Area. New Delhi. mcdonline.gov.in/townplan/.../Final%20Special%20Area%20Report.pdf
- Robert Kay Jacqueline Alder (2005), Coastal Planning and Management, Taylor and Francis Publications.

MURP2112 - Future Settlements	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To make students aware and expose to changing scenario in the spatial order of cities and regions as well as the emergence of virtual societies in the World. Also, to enable the students to understand the use and power of emerging new technologies and social networks among communities across the city, country and globe demand for paradigm shift in the spatial planning outlook and governance edge.

Unit I Planning and Technology**9**

Traditional settlements to modernity, spatial planning and technology interface, socio-economic planning and technology interface, planning cities and local technologies, technological innovations and responsive city planning, planning responsive technology versus technology responsive planning.

Unit II Cities-Technology-infrastructure**9**

Transportation and technology, water, sanitation and technology, energy efficient technology for home, street, neighbourhoods and city, telecommunication, health and education, security and safety for buildings and people in cities.

Unit III Techno Cities**9**

Digital cities, virtual cities, technology parks, smart planning and infill development; Planning, design and communication system, socio-economic and environmental impact of Techno Cities.

Unit IV Governance**9**

Role of law and technology, administration and organization, industry and corporate, communities and people in building smart cities and smart communities, participatory planning.

Unit IV Case Studies**9**

Best Practices in India and around the world.

Total: 45 Periods**Outcome:**

- Knowledge on the emerging and latest trends for development of future cities

References:

- Brkovic, M. B. (2004), Planning in the Information Age: Opportunities and Challenges of E-Planning, CORP.
- Intelligent Community Forum (2012), Innovation and Employment in the Intelligent Community, Intelligent Community Forum, pp1-35.
- Komakech, D. (2005), Achieving More Intelligent Cities, Municipal Engineer, pp259-264.
- Nohrstedt, (2002), Digital Planning: Integrating New Information and Communication Technologies in Urban Planning.

MURP2113 - Tourism Planning and Development	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide exposure to students on the concepts, planning, development issues related to tourism planning and development.

Unit I Introduction to Tourism**9**

Definitions, scope, nature, types, key determinants, characteristics of tourism; tourism hubs; tourism as an industry; growth of tourism in developed and developing world; problems and issues of tourism; Sociology of Tourism – leisure, recreation, travel and tourism; gender and tourism development; history, language and multi-cultural aspects of Tourism

Unit II Tourism Sector – Impacts**9**

Relationship between Tourism and Urban Development, environment and local community; Tourism multiplier and forecasting methods; capacity building and carrying capacity; planning for tourism projects; Tourism-cultural and social aspects; Eco-tourism and local social and economic development. Cross Boarder Tourism- State, National and Global Perspective.

Unit III Planning for Tourism**9**

Tourism Plans- plan components; social and spatial planning of origin–transit-destination area planning; Role of multiple Government authorities and agencies involved in tourism development; Role of private sector, local community in tourism development; Tourism circuits – planning and development of regions.

Unit IV Tourism Infrastructure**9**

Need for infrastructure support planning such as accommodation transportation, water supply, solid waste disposal, health, safety and information system; Tourist Infrastructure Services: Tourist guides, interpretation and signages; Impact on local life style; Revenue streams and resource; Package tourism and pricing; Tourism-Travel and hospitality.

Unit IV Tourism Policies and programs**9**

Tourism policies at state and national levels; Government and community interventions to develop tourism sector; Governance Vs e-governance and tourism development. Global Tourism Governance -Sustainable Development Goal, World Tourism Organization Initiatives.

Total: 45 Periods**Outcome:**

- Knowledge on infrastructure and policies/programs concerned to tourism planning and development.

References:

- Ni Made Ernawati and Ni Made Rai Sukmawati (2023), Tourism Business Planning and Development.
- Robin Nunkoo and Stephen L.J. Smith Trust (2014) Tourism Development and Planning (Contemporary Geographies of Leisure, Tourism and Mobility)
- Clare A. Gunn, (1993), Tourism Planning: Basics, Concepts, Cases, Taylor & Francis Group, London
- David L. Edgell Sr., (2006), Managing Sustainable Tourism: A Legacy for the Future, Haworth Press.
- James Mark, (2003), Tourism and Economy, Versa Press, London.
- Martha Honey, (1998), Ecotourism and Sustainable Development: Who Owns Paradise? Island Press.

MURP2114 - Planning and Politics	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide political economic perspective of planning special context to the cities of world and also to equip students on theorizing cities through the lens of politics. The course will focus more on case studies across the world.

Unit I Introduction 9

Basic concepts; Structural Adjustment and cities; Contested cities.

Unit II Politics and Society 9

Postmodern Urbanism; Critical urban theory; Civil Society and Political society; Collaborative governance and citizen participation.

Unit III Spatial Politics 9

Spatial politics: Politics of public space; Politics of environment.

Unit IV Political Movements 9

Terrorism and surveillance, Politics of radical movements, Social movements; Case studies from: Chipko movement, Narmada movement, wall street protest, Cochabamba water riot.

Unit V Politics and Policy 9

Urban policy and the politics of spatial and temporal scale; Power and urban hegemony; Capacity and social capital, Politics of scale and networks of association in public participation GIS; Mega projects and politics of city development.

Total: 45 Periods

Outcome:

- Capability to understand the political economic perspective of planning

References:

- Ghose, Rina (2005), The Complexities of Citizen Participation through Collaborative Governance. Space and Polity, 9(1): 61-75.
- Harvey David (2012), Rebel Cities; Verso Books, London.
- Smith, Neil (2002), New globalism, new urbanism: Gentrification as Global Urban Strategy, Oxford University Press, New York.
- Thompson L and Tapscott C (Ed.) (2010), Citizenship and Social Movements- Perspectives from the Global South; Zen Books, London.

MURP2115 - Advanced Quantitative Methods for Planning	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective: Equip students with advanced quantitative methods for planning, covering data mining, big data analysis, programming languages, and simulation techniques, to facilitate informed decision-making in urban planning and public policy.

Unit I Data mining and Application Program Interface (APIs) 9

Introduction to data mining, machine learning, AI; formulation of research questions in machine learning framework; Build, evaluate, compare, select and interpret various models; Introduction to API and tools to interact with network-based APIs.

Unit II Big Data and Policy Research 9

Big data landscape; comparison of big data, survey data and other data commonly used in spatial planning and public policy; Advantages and Disadvantages of data sources for research. Problems and Errors in Big data. Big data sharing policy. Policy analysis.

Unit II Programming languages for Data Analytics – part 1 9

Introduction to R/Matlab, basics on data coding, testing and analysis, data visualisation, model building and queries. Introduction to SQL, DBMS.

Unit III Programming languages for Data Analytics – part 2 9

Introduction to Python, basics on data analysis using python, coding, variables, data structures, logical functions and exercises, packages and computational environment.

Unit IV Simulation techniques in planning 9

System dynamics, agent-based modelling, ANN, network and location optimisation methods, discrete event simulation and stack-flow models, monte-carlo method, multimethod simulation, computational fluid dynamics models, AI generated models, etc.

Total: 45 Periods

Outcome:

- Knowledge on data mining, API utilization, and predictive modeling to formulate research questions effectively and interpret models accurately. They will also develop proficiency in R, MATLAB, Python, and SQL for streamlined data analysis, visualization, and modeling processes.

References:

1. Data Analysis, Visualization, and Modelling for the Data Scientist by Thomas Mailund, 2017.
2. Analytics and Data Science : Advances in Research and Pedagogy / edited by Amit V. Deokar, Ashish Gupta, Lakshmi S. Iyer, Mary C. Jones.
3. Applied Data Analysis for Urban Planning and Management by Alasdair Rae and Cecilia Wong, 2021.
4. Jinyan Huang and Shahbaz Hussain (2023), Advanced Quantitative Research Methods.

MURP2116 - Principles of Sustainable Development	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective: To equip students with a comprehensive understanding of sustainable development principles, goals, and practices, including the environmental, economic, and social pillars, as well as strategies for monitoring and assessing progress towards global sustainability targets.

UNIT I Sustainability Concept and Principles 9

Core problems and cross-cutting issues of the 21st Century; History and emergence of sustainable development; Environmental, Economic and Social Pillars of sustainability; strong and weak sustainability-mind-sets for sustainability: earthly, analytical, precautionary, action and collaborative; syndromes of global change: utilisation syndromes, development syndromes, and sink syndromes; Sustainable development models; Rio Principles of sustainable development ; Peoples Earth Charter; Ten Principles of the UN Global Compact.

UNIT II Sustainable Development Goals and Society 9

Social shortfall and ecological overshoot of nations; 'United Nations' 2030 Agenda for sustainable development; 17 sustainable development goals and targets, indicators and intervention areas; The Unjust World and Inequities; Quality of Life; Poverty, Population and Pollution; Combating Poverty; Demographic dynamics of sustainability; Actions to reach the 2030 Agenda for sustainable development; Sustainable Livelihood Framework-Health, Education and Empowerment of Women, Children, Youth, Indigenous People, Non-Governmental Organizations and Local Authorities.

Unit III Ecosystem Conservation and Restoration 9

Conservation Vs restoration - Prevention, Precaution, Preservation and Public Participation - Selection and implementation of restoration interventions; Sustainable Consumption and Production; Investing in Natural Capital- Agriculture, Forests, Fisheries - Food security and nutrition and sustainable agriculture- Water and sanitation-Biodiversity conservation and Ecosystem integrity; Ecotourism; Climate Change-Paris agreement; Mitigation and Adaptation; Safeguarding Marine Resources.

UNIT IV Science, Technology and Innovation for Sustainability 9

Science and Technology for sustainable development; Applying science, technology and innovation for Water, Energy, Mobility, Circularity, Housing, Equity and Empowerment; Nature of sustainable development strategies and current practice; Resource efficiency; Decoupling- Sustainable Cities ;Green Buildings - Sustainable Transportation; Sustainable Mining; Sustainable Energy; Inclusive Green Growth and Green Economy; Financial frameworks and resources to advance the Agenda-2030.

UNIT V Monitoring and Assessing Progress 9

Sustainability in global, regional and national context; Actions to localizing SDGs; Performance indicators of sustainability and Assessment mechanism; Approaches to measuring and analysing sustainability; limitations of GDP- Data-Driven Assessment of Sustainability; Carbon Foot Print, Ecological Footprint; Human Development Index-Business charter for sustainable development; Sustainable Development Goals (SDGs)

Environment, Social, and Governance (ESG), Corporate Social Responsibility (CSR) and Sustainability-ESG Reporting and Corporate Sustainability

Total: 45 Periods

Outcome:

- Explain and evaluate current challenges to sustainability, including social, environmental, and economic issues which prevail in the system and analyse the social, environmental, and economic dimensions of sustainability in terms of UN Sustainable development goals.

References:

1. A guide to SDG interactions: from science to implementation, International Council for Science, Paris, 2017.
2. Tom Tietenberg, Lynne Lewis, Natural Resource Economics: The Essentials, Taylor& Francis, 2019.
3. Ajay Ahlawat (2019), Sustainable Development Goals: Directive Principles for Sustainable India by 2030, MyARSu.
4. John Asafu Adjaye, "Environmental Economics for non-economists – techniques and policies for Sustainable Development", World Scientific, 2005.
5. Karel Mulder (2017), Sustainable Development for Engineers - A Handbook and Resource Guide, Routledge Taylor and Francis, 2017.
6. Klaus Bosselmann (2017), The Principle of Sustainability - Transforming Law and Governance, Routledge.
7. NITI Aayog (2022), The Indian Model of SDG Localization, and other Reports of NITI Aayog, Government of India.

MURP2117- Globalization & Social Equity	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: The course aims to integrate globalisation's impact on community equity into urban planning pedagogy, fostering awareness of disruptive forces and transnational perspectives on societal issues for future application and research.

Unit 1: Climate Change in a Globalized World **9**

Introductory overview, causes, impacts, mitigation strategies, climate plans and policies, UN climate change policies, resilience within sustainable development, climate policies at national, state, and local levels, urbanization, globalization, drivers of Anthropocene.

Unit 2: Sustainable Development Goals **9**

Urban and regional sustainability approaches, SDGs, MDGs, carbon credits, net-zero cities, environmental justice, urban sustainability solutions, interplay of SDGs, SDG-6 and SDG-11, intricate interrelationships of SDGs, direct connection to climate change, role of sustainability.

Unit 3: Urban and Regional Metabolism **9**

Understanding and measuring flows: water, storm water, solid and liquid wastes, energy, food, raw materials, interconnections of flows, cyborg concept, critical infrastructure, urban resilience, connections between flows, micro to macro scales, critical infrastructure with case studies.

Unit 4: Climate Impacts, Movements, and Emerging Practices **9**

Movements, protests, battlegrounds, climate action, sustainability, climate refugees, bourgeois environmentalism, environmental justice, global inequality, climate impacts, intersectionality, environmental, social, economic vulnerabilities, emerging practices, case studies.

Total: 45 Periods

Outcome:

Students will gain critical thinking skills to analyze globalisation's impact on social equity and apply interdisciplinary knowledge to address urban challenges. They will develop transnational perspectives and practical solutions for urban planning and research.

References:

1. Lo, F., & Marcotullio, P. J. (2000). Globalisation and Urban Transformations in the AsiaPacific Region: A Review. *Urban Studies*, 37(1), 77–111.
2. Grime, K. (1976). Book Review: An Introduction to Regional Planning: by JOHN GLASSON. London: Hutchinson Educational.
3. Stephen Wheeler (2009) Regions, Megaregions, and Sustainability, *Regional Studies*, 43:6, 863-876.
4. Guy, M. E., & McCandless, S. A. (2012). Social Equity: Its Legacy, Its Promise. *Public Administration Review*, 72, S5–S13.
5. Frederickson, H.G. (2010). *Social Equity and Public Administration: Origins, Developments, and Applications: Origins, Developments, and Applications* (1st ed.). Routledge.
6. Marzano, F. (2001). Globalisation and Social Equity. In: Franzini, M., Pizzuti, F.R. (eds) *Globalisation, Institutions and Social Cohesion*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-04407-0_14
7. Brown-Saracino, J. (2010). *The Gentrification Debates: A Reader* (1st ed.). Routledge. <https://doi.org/10.4324/9781315881096>

MURP2118 – Indian Knowledge Systems	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: This course aims to explore Indian knowledge systems, encompassing diverse fields such as astronomy, mathematics, cosmology, and philosophy, fostering a deep understanding and appreciation of India's intellectual heritage in the field of physical planning through the study of various Shastric Texts and Ancient treatises.

Unit 1: Bhāratīya Civilization and Development of Knowledge System

9

History the Akanda Bharath – its genesis - antiquity of civilization, Traditional Knowledge System, The Vedas, Main Schools of Philosophy, Ancient Education System, the Takṣaśilā University, the Nālandā University, Ghatikas as learning centres, Knowledge Export from Bhārata – Development of Arts – Development in the field of literature, music, medicine

Unit 2: Science, Astronomy, Mathematics, and Technology

9

Concept of Matter, Life, and Universe, Vedic Cosmology and Modern Concepts, Bhāratīya Kāla-gaṇanā, Kerala School for Mathematics and Astronomy, History and Culture of Astronomy, Concepts of Zero and Pi, Vedic Mathematics and Number System . Impact of mathematics, astronomy , astrology , philosophy , nature in the traditional planning principles - Texts from various Shastric sources – Brief on Inscriptional records

Unit 3: Town Planning and Architecture

9

Evolution of urban settlements in ancient India, Principles of town planning in ancient Indian cities – Ancient treatises in Town planning – Manasara, Mayamatham, Sthapadya Veda, Samaranga Suthradhara -,– Metaphysical Interpretation of spaces – Concept of Time and Space in planning .Case studies of ancient Indian cities: Mohenjo-Daro, Harappa, Varanasi,Madurai and Kancheepuram . Influence of religious and cultural beliefs on urban design and architecture- Temple centric development of towns , Sustainability and resilience in ancient urban planning practices.

Unit 4 – Indian Knowledge system on Town Planning

9

Town planning principles – classification of towns and villages based on function , typology, layout, shape and so on .Critical appraisal of Site selection, orientation , Site analysis, layout, spatial organisation of streets and open spaces , Landuse Regulations from the various treatises- Exercises on layout preparation – The grammar and syntax in the urban planning process- Application of the vedic planning principles – case studies – water management system and irrigational practices ,land classification land reclamation , administration , environmental governance, sustainability , urban regulation – their relevance in the present context

Unit 5 – Case Studies

9

Legacy of ancient planning systems and their relevance to modern urban management, Lessons for contemporary urban governance from ancient Indian practices – Documentation of villages /towns/waterfronts/ waterbodies / indigenous practices

Total: 45 Periods

Outcome:

Students will develop critical thinking skills and the ability to assess the relevance of Indian knowledge systems in contemporary contexts, contributing to a broader understanding of India's cultural and intellectual legacy.

References:

1. . Acharya, P K, 1931, Indian architecture according to Manasara- Silpasashtra (Manasara Series Vol 2), Munshiram Manoharlal
2. Shamasastri, R., 1915, Kautilya's Arthasastra, Sri Raghuveer Printing Press
3. Acharya, Prasanna Kumar, 1933, Architecture of Manasara (Manasara Series Vol 1,4 & 5), Bharatiya Kala Prakashan
4. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al. Samskrit Bharati (2006). 2. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012). 3. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd. (2010)

Fourth Semester

MURP221 - Planning Thesis	Subject Category	T
	Number of Credits	24
	Lecture Periods per Week	2
	Tutorials Periods per Week	-
	Studio/Lab/Workshop/Practical's	22
	Total Periods per Week	24

Objectives:

- To enable the students to undertake original and independent study / research in the form of terminal thesis / project on a topic of their choice approved in the previous semester.

Each student shall prepare thesis on a topic approved by the department under the guidance of the allotted supervisor. The thesis will provide an opportunity to the student to synthesise and apply the knowledge and skills acquired through the learning of various theories and practices during the course. The students are expected to work in various stages. Each student shall be required to present the work in the format as suggested by the department i.e., orally, graphically, written, etc. The thesis shall be monitored continuously and periodically through internal marked reviews to check the consistency of work, the relevance of the analysis with respect to the data collected and project scope, and the progress towards logical proposals. Each stage shall be evaluated by a panel. These stages may broadly be outlined as:

Unit I Thesis Proposal**Unit II Development of Suitable Methodology / Framework****Unit III Literature Search and Review****Unit IV Data Collection, Analysis and Synthesis****Unit IV Findings / Proposals****Total: 225 Periods****Outcome:**

- The final output shall be in the form of a draft report, which once approved by the department will be followed by the submission of a detailed report and drawing/visuals for external jury members, in a given format. The thesis shall also be presented orally in external jury by each student in the form of visuals / drawings as necessary for each topic.

References:

1. Elizabeth A. Wentz (2013), How to Design, Write, and Present a Successful Dissertation Proposal, Sage Publications.
2. John Biggam (2015), Succeeding with Your Master's Dissertation: A Step-By-Step Handbook, Open University Press, McGraw Hill Education, UK.
3. Murray, Rowena (2011), How To Write A Thesis, Open University Press, McGraw Hill Education, UK.
4. Tayie, Sami (2005), Research Methods and Writing Research Proposals, Pathways to Higher Education, Cairo.

MURP222 - Development Finance	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To expose students to the various concepts, mechanisms and role of development finance and its relevance with various hierarchies of government systems.

Unit I Overview of Development Finance**9**

Concept of development finance, Approaches, Development administration at National, State and Local level and the process of formulation, implementation and management, Structure of implementing authorities: Improvement trusts, Development authorities, Metropolitan Development Authorities and their relationship with local governments. Financial institution: concept, typology and their role.

Unit II Municipal Finance Institutions**9**

Finance Commissions, fiscal agenda of development schemes and Sources of revenues; equities; loans; debt financing; Pooled finance development fund, national urban infrastructure fund, municipal bonds, miscellaneous sources.

Unit III Financial Management & Resources**9**

Structure of finances, fiscal problems and issues of financial management, credit rating, Implications of 74th Amendment for municipal finance, expenditure pattern, bilateral and multi-lateral lending intuitions mobilizing resources for a project - financial resources, land resources, project resources, and other resources.

Unit IV Investment Planning**9**

Link with spatial plans, process, components, investment needs, budgeting, financial investments in infrastructure and services.

Unit V Financing Mechanism**9**

Financing of urban development, infrastructure and services – mechanisms and instruments, subsidy reduction, cost recovery, public private partnerships; Micro finance, Financial appraisal, investment appraisal; Financial risk – sources, measures and perspectives on risk, sensitivity analysis, property tax administration, rent control system.

Total: 45 Periods**Outcome:**

- Knowledge on concepts and mechanisms for financing development and management.

References:

- Prasanna K. Mohanty (2016) Financing Cities In India: Municipal Reforms, Fiscal Accountability And Urban Infrastructure.
- Richard, Richard Hemming and H.Barry (2013), The International Handbook of Public Financial Management Centre for Aid and Public Expenditure.
- Allen. F, Yago. G (2013), Financing the Future, Market-Based Innovations for Growth, Pearson Publications.
- Gupta J. (2008), Privatisation of Municipal Finance in India, Atlantic Publishers and Distributors.
- Stephen Spratt (2008), Development Finance: Debates, Dogmas and New Directions, Routledge Publications.

MURP223 - Professional Practice and Ethics in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives: To equip students with practical skills, ethical understanding, and industry-relevant competencies essential for success in their chosen profession.

Unit I Foundations of Planning Practice and Professional Ethics

9

Introduction to Urban and Regional Planning; Recent reforms in the planning system; Planning practice and classification of assignments; Spatial planner and his qualities and responsibilities; Clients in planning practice; ITPI and its scope; Role of Planners in Urban Development Sector; Typical Responsibilities. Ethical frameworks, professional conduct, ethical dilemmas, equity, sustainability, accountability, societal interests, values, ethical challenges, moral hazards and contemporary issues in planning practice

Unit II Planning and Public Sector

9

Planning at national level, interstate level, state government level, district level, metropolitan level, and local level; Consultancy practice in the public sector; Role of government as a facilitator; Procurement of goods, works, consulting services, and non-consulting services; Bid Process and Its Management; E-tendering.

Unit III Private Sector Collaboration in Planning

9

Initiation of the Private Sector in Planning Practice; Need for private sector involvement; Types of private sector participants, consultants, contractors, and developers; Systems of private sector participation; Developing Terms of References (TOR); Drafting Expression of Interest (EOI).

Unit IV Joint Sector and Public-Private Partnership

9

Professional Practice in the Joint Sector; Understanding Joint sector; Public-private partnership; Models of PPP (case-based approach); Drafting Request for Proposal (RFP); Drafting a Concession Agreement.

Unit V Global Perspectives in Contemporary Planning Practice

9

International Urban Planning Practice: Effect of liberalisation, privatisation, and globalisation on planning practice; Models of the supply of services; Understanding GATS (General Agreement on Trade in Services); Role of Planners in Consultancy and Advisory; Role of Planners in Research & NGOs; Role of Planners as Entrepreneur;

Total: 45 Periods

Outcome:

- Technical communication, problem-solving abilities, and adherence to ethical standards, preparedness for real-world professional scenarios.

References:

1. Campbell, H. and Marshall, R. (1998) Acting on Principle: Dilemmas in Planning Practice, Planning Practice and Research, Vol.13, No.2, pp.117-128.
2. ITPI (Institute of Town Planners, India). 1986. Report of the task force on Professional matters urban development and the town Planner. ITPI, New Delhi.
3. Kulshreshtha, S.K. (2012) Urban and Regional Planning in India - A Handbook for Professional Practice. SAGE Publications India Private limited, New Delhi.
4. Madhusudan Apte, Prakash (2013), Urban Planning & Development an Indian Perspective.

Master of Planning

(Transport Planning)

Course Structure and Detailed Syllabus for
Two Year Masters Degree Programme in Planning

Effective from the Academic Year 2024-25 onwards

(As Approved by the Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाडा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA.

Introduction to Master of Planning (Transport Planning)

Master of Planning (Transport Planning), abbreviated as M. Plan (TP), is a two-year full-time Master's degree Programme in Planning aimed to equip the students with adequate skills required to comprehend urban and regional transport-based issues. The course is designed to provide the necessary exposure to various transport planning processes, emerging trends and other related advanced technical know-how. It intends to contribute towards the creation of professionals in the field and hence cater to the specific needs of the industry and academics. During this course, the students are provided with ample opportunities to interact with subject experts, relevant organizations, etc. The course enables the students to gain real time experience through their involvement in ongoing live projects. Also, they are exposed to proficient expertise in planning through a full-time faculty and distinguished visiting faculty members. M.Plan (MTP) is a two-year course consisting of four semesters. The course structure and syllabus are designed with coherence and reference to the Model Curriculum for Master of Planning by the All India Council for Technical Education (AICTE) 2020 and Model Curriculum for Master of Planning by ITPI, Orienting Planning Education in Line with NEP 2020. The course structure is a combination of various subjects, which includes studios, labs, theory, and field visits. The broad course structure is as follows:

Semester 1: This is an Integrated semester common to all master courses of planning offered by the institute, it includes area planning studio, Infrastructure planning, Data Analytics and Techniques in Planning, Planning theories and concepts etc. that serves as an introduction to planning for all the students from different background as well as exposure to all sections of urban and rural planning.

Semester 2: This semester focusses on detailed study of transportation sector by developing comprehensive mobility plan of urban areas. Subjects offered are Urban Transport Planning, and Public Transport Planning, Highway Planning and Traffic System Design, Geo-Spatial Techniques in Transportation etc. The students are also given professional exposure through practical training of a month during summer vacation after second semester.

Semester 3: This semester focusses on developing detailed project report for transportation projects. Subjects offered in this semester are Advanced Research Methods, Transport Infrastructure Design, Transport Economics, Logistics and Freight Distribution etc. that dive deep into detailed process of transport planning and related expertise.

Semester 4: This semester students would be required to undertake thesis project or research in the field of transport. In addition, two theory subjects are offered namely Project formulation, transport policies and governance.

In addition to the theory subjects and studios, students are offered several electives to choose from namely Road Safety and Environment, Smart Mobility, Regional Transport Planning, Port Planning, Sociology and Transport Planning, Transport Infrastructure for Tourism Sector, Transport Infrastructure Finance. Also, the curriculum is designed in such a way so that the students pursuing Masters in Transport Planning can take elective subjects from Master Programmes, which gives them diverse knowledge. The department also offers different audit courses such as NSS, Yoga, Dance and Music in all the semesters.

Course Structure

First Semester (Integrated)

S.No.	Subject Code	Subject Title	Distribution of Periods per week			Contact Periods / week	Total Credits	Subject Category
			Lecture (L)	Tutorial (T)	Studio/ Practical (S/P)			
1	MPIS111	Area Planning Studio	3	0	12	15	15	SC
2	MPIS112	Planning Theories and Concepts	2	1	0	3	3	TC
3	MPIS113	Data Analytics and Techniques in Planning	2	1	0	3	3	TC
4	MPIS114	Habitat and Environment Planning	2	1	0	3	3	TC
5	MPIS115	Infrastructure Planning	2	1	0	3	3	TC
6	MPIS116	Socio-Economic Dimensions in Planning	2	1	0	3	3	TC
TOTAL:			13	5	12	30	30	

Second Semester

S.No.	Subject Code	Subject Title	Distribution of Periods per week			Contact Periods / week	Total Credits	Subject Category
			Lecture (L)	Tutorial (T)	Studio/ Practical (S/P)			
1	MTP121	Transport Planning Studio II	3	0	12	15	15	SC
2	MTP122	Geospatial Techniques for Transportation	1	1	1	3	3	JC
3	MTP123	Highway planning and Traffic System Design	2	1	0	3	3	TC
4	MTP124	Urban Transport Planning	2	1	0	3	3	TC
5	MTP125	Public Transport Planning	2	1	0	3	3	TC
Elective 1: ANY ONE								
6	MTP1210	Sociology and Transport Planning	2	1	0	3	3	OE
7	MTP1211	Road Safety and Environment	2	1	0	3	3	OE
8	MTP1212	Smart Mobility	2	1	0	3	3	PE
9	MTP1213	Travel Behaviour	2	1	0	3	3	PE
9	MTP1214	From other Master Programmes (Same Semester) / online platform duly approved the department	2	1	0	3	3	OE
ECOC Audit Courses: ANY ONE								
10	ECOC1	To be Chosen						A
11	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
12	PBOC1	To be Chosen						A
13	PBOC2	To be Chosen						A
TOTAL			12	5	13	30	30	

Note 1: Compulsory Summer Professional training / internship (of six weeks) after second semester is to be undertaken by each student. The compulsory training shall be deemed as completed only when the Department of Planning examines the work of each student in the subsequent third semester and declares it to be "Satisfactorily Completed".

Third Semester

S.No.	Subject Code	Subject Title	Distribution of Periods per week			Contact Periods / week	Total Credits	Subject Category
			Lecture (L)	Tutorial (T)	Studio/ Practical (S/P)			
1	MTP211	Transport Infrastructure Planning Studio	3	0	12	15	15	SC
2	MPIS212	Research Methods	2	1	0	3	3	TC
3	MTP213	Logistics and Freight Distribution	2	1	0	3	3	TC
4	MTP214	Transport Economics	2	1	0	3	3	TC
5	MTP215	Transport Infrastructure Design	2	1	0	3	3	TC
Elective 2: ANY ONE								
6	MTP2110	Port Planning	2	1	0	3	3	PE
7	MTP2111	Transport Infrastructure for Tourism Sector	2	1	0	3	3	OE
8	MTP2112	Transport Infrastructure Finance	2	1	0	3	3	PE
9	MTP2113	Regional Transport Planning	2	1	0	3	3	PE
10	MTP 2114	Logistics Inventory Management	2	1	0	3	3	PE
11	MTP 2115/MEPM215	Energy Studies in Planning	2	1	0	3	3	OE
12	MTP 2116	From other Masters programme (same semester)/ online platform duly approved the department	2	1	0	3	3	OE
ECOC Audit Courses: ANY ONE								
13	ECOC1	To be Chosen						A
14	ECOC2	To be Chosen						A
PBOC Audit Courses: ANY ONE								
15	PBOC1	To be Chosen						A
16	PBOC2	To be Chosen						A
		TOTAL	13	5	12	30	30	

Fourth Semester

S.No.	Subject Code	Subject Title	Distribution of Periods per week			Contact Periods / week	Total Credits	Subject Category
			Lecture (L)	Tutorial (T)	Studio/ Practical (S/P)			
1	MTP221	Transport Planning Thesis	2	0	22	24	24	SC
2	MTP222	Project Formulation and Appraisal	2	1	0	3	3	TC
3	MTP223	Transport Policy and Governance	2	1	0	3	3	TC
		TOTAL:	6	2	22	30	30	

Note 2: Credits for each subject are the same as the number of lecture / practical hours per week, whichever is higher.

Subject Code Nomenclature:

MTP = Masters in Transport Planning;
1st Subject. **MTP211** is to be read as:
2 (1st digit) = 2nd Year; 1 (2nd digit) = 1st Sem of 2nd Year; 1 (3rd digit) =

MTP 2110 is to be read as:
MTP = Masters in Transport Planning;
Elective Subject. 2 (1st digit) = 2nd Year; 1 (2nd digit) = 1st Sem of 2nd Year; 10 (3rd & 4th digit) = 1st

Subject Category Nomenclature:

SC = Studio Core Subject	TC = Theory Core Subject	JC = Jury Core Subject
PE = Professional Electives	A = Audit Subjects	OE = Electives from Other Masters Programme (Same Semester), online platform duly approved by department

SC (Studio Core Subject): These subjects are the practical backbone of the curriculum, focusing on hands-on projects and real-world applications, essential for mastering planning skills.

TC (Theory Core Subject): These subjects provide the theoretical foundation, covering key concepts, methodologies, and frameworks necessary for understanding urban and regional planning.

JC (Jury Core Subject): These subjects involve assessments and presentations, where students present their projects and designs before external experts at the end of the semester, fostering evaluation and feedback.

PE (Professional Electives): These subjects focus on advanced professional skills and knowledge, preparing students for specific career paths within the planning industry.

OE (Electives from Other Masters Programme - Same Semester): These subjects provide an interdisciplinary approach by allowing students to take courses from other master's programs, broadening their academic perspective.

ECOC and PBOC are the open electives that are non-graded courses.

Detailed Syllabus
for
Master of Planning
(Transport Planning)

First Year – First Semester – Integrated Semester

MPIS111- Area Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practicals	12
	Total Periods per Week	15

Objective:

- To enable the students to understand the socio-economic and spatio-cultural, environmental characteristics along with the land-use dynamics of the study area.
- To plan for rational physical and socio-economic interventions for sustainable and harmonious development of the future.

Part A: Literature and Documentary Review on the selected themes **15**

Area Appreciation at the Neighbourhood level **30**

Understanding the linkages between different aspects of socio-economic life in relation to the land-use in the cities. Preparation of area profiles in the city, such as residential, commercial, recreational, industrial, slum area and institutional area. Studying impact of land use, economic and socio-cultural activities on the physical environment of the area.

Part B: Village Planning **60**

Preparation of plans for the identified village/s by studying the physical, socio-cultural, economic, environmental and governance aspects. Understanding how development impacts villages and the communities. Appreciating the need for balancing development with sustaining the livelihoods of rural communities and drawing plans for suggested interventions for the community. Community Engagement and Integrating Indian Knowledge System (One week field visit including community engagement)

Part C: Local Area Planning/ Area Development Planning **120**

Preparation of neighbourhood plan considering different user groups. This may involve the preparation of local area plans/ area development plans/ residential / site plans (low and high density) preferably for areas where new developments are coming up.

Students need to understand the need for a balanced development with incorporation of elements like sustainability, livelihood, environmental protection, inclusive growth and institutional engagement. In addition, emphasis will be given on planning terminologies, strengthening the planning vocabulary and technical communication skills.

Total: 225 Periods

Outcomes:

- Basic knowledge and skillset to prepare the grassroot level plans
- Capability to prepare local area/ sub-city level plans by integrating the sectoral needs
- Students' skills in area appreciation, mapping and site planning techniques

References:

1. Government of India (Ministry of Urban Development and Town and Country Planning Organisation) (2015), Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Vol. 1, Ministry of Urban Development, New Delhi.
2. Manitoba Intergovernmental Affairs and City of Winnipeg's Planning, Property and Development Department – Planning and Land Use Division (2002), A Guide for Developing Neighbourhood Plan.

3. Thomas Russ. R(2009), Site Planning and Design Handbook. McGraw Hill Publications.
4. Singh. K (2009), Rural Development Principles, Policies and Management. Sage Publications, Pvt. Ltd, New Delhi.
5. Gram Panchayat Spatial Development Plans as developed under the guidelines of MoPR, Go

MPIS112 - Planning Theories and Concepts	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To equip the students with the required knowledge of conventional and contemporary planning thought, pluralistic nature of values in the profession, planning approaches and models. Focus would be on integrating procedural and substantive elements of planning theory to current and future planning practices

Unit I Planning Concepts**9**

Settlement systems, Classification of settlements, primate city, central place concept, concepts of complementary area, central goods and services, range, threshold etc; city-region relationship; structure of city regions, area of influence, dominance; rural-urban fringes; push and pull factors; migration; need for planning; Scalar arrangements in Planning (regional, mega, metro regions, city and local area plans).

Unit II Rational Planning Approaches and Models**9**

Systems approach to planning; Comprehensive development plan; Pluralism in planning; Strategic planning; Structure plans; Incremental planning; Equity based planning; Inclusive planning; Participatory planning – Collaborative and communicative planning; Introduction to Political economy model, New economic geography models & globalisation models.

Unit III Techniques of Plan Preparation**9**

Surveys, Techniques of conducting surveys for land use, building use, density, structural condition of buildings, heights of building, land utilization and physical features of land; Techniques of mapping – methodologies, physical surveys, land use classification, base map preparation for various levels of plans; Choice of appropriate scales for various types of plans; Data requirement for various types of plans; Planning standards and regulations – Spatial standards, performance standards and standards for utilities, URDPFI guidelines, development control regulations.

Unit IV Methods and Tools**9**

Analytical methods - linear programming, threshold analysis, simulation, rank size rule, scalogram, sociogram, cluster and factor analysis, delineation techniques, SWOT analysis; location models, gravity models.

Unit V Emerging and Future Trends**9**

Emerging school of thoughts and doctrines; Recent and contemporary contributions to the changing planning paradigms; Planning for future and in future - vision development, strategising, Implementation of planning policies and development plans.

Total: 45 Periods**Outcomes:**

- Application of relevant planning theories and concepts in urban and regional planning

References:

- C S Bertuglia, G. Leonardi, (eds) (2018). Urban Systems: Contemporary Approaches to Modelling. Routledge, London.

2. Richard E. Klosterman, Kerry Brooks, Joshua Drucker, Edward Feser, Henry Renski (2018). Planning Support Methods: Urban and Regional Analysis and Projection. Rowman & Littlefield Publishers.
3. Wang, Xinhao & Hofe, Rainer (2007). Research Methods in Urban and Regional Planning. Springer-Verlag Berlin Heidelberg. Tsinghua University Press.
4. Philip Allmendinger (2017). Planning Theory. Macmillan Education Publications.

MPIS113 - Data Analytics and Techniques in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To acquire proficiency in quantitative techniques and computing tools that are applicable in planning domain to conduct empirical studies.

Unit I Data sources and surveys in Planning 9

Types of data, data aggregation, units of measurement, standard notation; coding and decoding methods, tabulation and graphical presentation of data; Introducing web-based information portals and datasets as raw information sources; Elementary association models and decision making; Index Numbers (weighted and unweighted); Application of index number in spatial planning; Calculation techniques of vital events; Quantitative and qualitative data collection methods; Validity and reliability of data; Questionnaire design and typology; measurement scales and their applications; Sampling techniques, sample size calculations.

Unit II Introduction to Statistical Methods for Planning 9

Descriptive statistics (Frequency distribution; Measures of central tendency; Measures of dispersion); Introduction to probability; normal and standard normal distribution; Tests of hypothesis- type I & II errors, one-tailed and two tailed tests, chi-square test, student T test.

Unit III Correlation and Regression 9

Correlation – scatter plot diagrams, correlation coefficients; Least square method; Assumptions of regression analysis, linear regression, multiple regressions; Dummy variables; Functional forms; Binary dependent variables; Instrument variables; Time series analysis;

Unit IV Spatial Data and Geographic Information Systems 9

Definitions – Geoinformatics, Remote Sensing, Geographic Information Systems (GIS), the concept of earth surface projections; the need for GIS, Spatial Data Infrastructure; accuracy and precision, raster and vector data, spatial thematic models, Components of a GIS; spatial and attribute data- input and output; spatial data entry- data structure for GIS, vector data structures; Coordinate systems; Geodetic data - point positioning, problems, measurements, spatial analysis using lab modules, etc.

Unit V Planning Techniques 9

Maps as a representation of reality, Elements of Maps; Graphical, linear and areal scales, Notations involving basic discipline of maps; Measurement of areas; Data creation and query; Map preparation – Geo-referencing, digitization, scales, layers, layout, topology creation, spatial data analysis - buffer, overlay and multi criteria decision modelling, Hotspot analysis.

Note: Examples from spatial planning to be applied in each unit using softwares like QGIS, ArcGIS, Geoda, Spreadsheets, SPSS, etc.

Total: 45 Periods

Outcomes:

- Proficiency in using statistical and planning techniques in urban and regional planning

References:

1. Agarwal B L (2007), Programmed Statistics. New Age International Publishers, New Delhi.
2. Alan C. Acock (2012), A Gentle Introduction to STATA. Revised Third Edition.
3. Gupta and Gupta (2012), Business Statistics. Sultan Chand and Sons, Delhi.
4. Wooldridge (2011), Introductory Econometrics: A Modern Approach. Thomson Press, Noida.
5. Gujarati, D.N. and Porter, D.C., 2009. *Basic econometrics*. McGraw-hill.
6. Sachithanandan (2004), Reading material on Planning Techniques, Institute of Town Planners India, New Delhi.

MPIS114 - Habitat and Environmental Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To give insights on global and local issues of environmental concern and introduce fundamental concepts and policies related to housing.

Unit I Components of Nature and Ecology**9**

Meaning and components of nature; Basic concepts of ecology, process of flow of material, water, energy, invasion, succession, perdition, regulatory forces, adaptation, tropic levels, food chains, food web, ecological pyramids; Ecology and their relevance to planning; Modifications in natural environment, causes and consequences.

Unit II Global & Local Concerns for Environment**9**

Evolution of human settlements; Civilizations and impact on environment; Contemporary environmental discourse; Green agenda and brown agenda; Global environmental movement; Environment and poverty; Environmental management and environmental planning; Global warming, climate change; Biological diversity; Brunt land's Commission's Report; Agenda 21; Club of Rome Report; UNEP charters.

Unit III Environmental Resources: Consumption, Conservation and Recycling**9**

Environmental resources and ecosystem services; Concepts of natural reserves; Consumption, conservation and recycling of resources; India's environmental programmes; Government of India's policies relating to forest, wildlife, hill, water resources, wastelands, hills, coastlines, oceans, etc.; local climatic zones; vulnerability analysis, Climate Smart Cities and Sustainable Framework.

Unit IV Housing and Built Environment**9**

Significance of housing in national development goals; Housing as a basic entitlement - core issues of housing, factors affecting residential location, theoretical knowledge of ecological, neo-classical, institutional approach to housing; estimating housing shortage, housing need, current methods of demand assessment, typologies of housing, housing norms; Densities and standards; Urban sprawl and environmental damages; Gender based planning of neighbourhoods and human settlements.

Unit V Housing Sectors, Acts and Policies**9**

Affordable Housing; Housing for the low-income groups – slums and squatter settlements, investment in housing in public and private sectors; Cooperative housing, objectives and principles, management and financing of housing projects; Acts, policies and programmes; Comparative policy analysis.

Total: 45 Periods**Outcomes:**

- Understanding of the housing issues and environmental concerns in settlement planning

References:

- Thomas L. Daniels (2014). The Environmental Planning Handbook for Sustainable Communities and Regions. Planners Press, American Planning Association.
- Jetske A. Bouma, Pieter J. H. van Beukering (2015). Ecosystem Services: From Concept to Practice. Cambridge University Press.
- Van Bortel, Gerard, Vincent Gruis, Joost Nieuwenhuijzen & Ben Pluijmers, (Ed.) (2018), Affordable Housing Governance and Finance: Innovations, partnerships and comparative perspectives. Routledge, London.
- Nicholas Dagen Bloom, Lawrence Vale (2015). Public Housing Myths: Perception, Reality, and Social Policy. Cornell University Press

MPIS115 - Infrastructure Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To develop skill sets pertaining to provision of physical and social infrastructure services in urban and regional planning.

Unit I Introduction to Infrastructure Planning**9**

Importance of infrastructure, objectives of the utilities, services planning and implications on public health and environment; Role of physical planner in planning of utilities and services; Role of line agencies in municipal areas; jurisdiction and scope of work of line agencies; Resilient Infrastructure, Smart cities and its infrastructure.

Unit II Physical Infrastructure**9**

Water and Waste Water Scheme, Layouts of distribution system; IUWM, Water and Waste water treatment methods, Low-cost sanitation methods and storm water drains; Zero discharge systems; Integrated Solid Waste Management; MSWM 2000. Environmental Policy 2006; Urban Energy Systems and Civic services. Service Level Benchmarks.

Unit III Social and Economic Infrastructure**9**

Types of social infrastructure; Health care - essential service, availability, access and utilisation, standards, public and private institutions, policies, National Rural Healthcare Mission, hierarchy of health care establishments; Education - primary and secondary educational institutions, standards, policies, right to education (RTE); Public and community spaces – recreational, safety and security; Distributional services, Economic Infrastructure.

Unit IV Transportation and Land use Integration**9**

Introduction to transport and travel; Understanding travel from the mobility, economic, social-psychologist, time/space perspective; Factors affecting land use-transport integration, and tools for land use and transport integration, land use transport cycle, importance of accessibility, Transportation planning process; Introduction to four stage modelling; Demand and supply of transport; Congestion pricing; Transport Pricing, Basic transport economic model; SLBs; Introduction to carbon footprint.

Unit V Formulation of DPR for Infrastructure Services**9**

DPR and its importance; contents of DPR; broad sequences to DPR formulation; capabilities required to prepare a DPR; DPR evaluation, Project Cost, Institution Framework, Project Financial Structuring, Project Phasing, Project O&M planning, Project Financial Viability & Sustainability .

Total: 45 Periods**Outcome:**

- Knowledge and skillsets on planning for infrastructure services at urban, rural and regional level.

References:

- Dinesh M, Omer T, Michael S, Michael J, (2009), Road safety in India: challenges and opportunities. University of Michigan, Transport Research Institute.
- Government of India, (2010), Service level benchmarks for urban transport. Ministry of Urban Development. http://urbanindia.nic.in/programme/ut/Service_level.pdf
- Jaun de Dios Ortuzar, Luis G. Willumsen, Wiley, (2011), Modelling Transport (4th Edition), Routledge.
- Jean-Paul Rorigue, Claude Comtois, Brian Slack, (2006), *The geography of transport systems*. Routledge

MPIS116 - Socio-Economic Dimensions in Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practicals	-
	Total Periods per Week	3

Objectives:

- To provide an understanding of the society and the economy of the nation and its importance in spatial planning.

Unit I Introduction to Sociology**9**

Definition and scope of sociology; Concepts-society, social systems, social structure, institution and organisation; Understanding society- theories and methods; Sociology and planning, Planning and Sociology; Man – Environment relations and traditional spatial planning practices; Need for Demographic studies.

Unit II Social Groups, Social Issues, Rural and Urban Sociology**9**

Social groups, social stratification, social exclusion and social inclusion; Agrarian, industrial and modern society and spatial formation; Linking social structure and physical structure of village and urban settlements; Sociology of formal and informal settlements in cities and towns; sustainable society and liveable neighbourhoods; making of smart homes, communities and neighbourhoods.

Unit III Demography and Planning**9**

Traditional and modern theories of population, population dynamics, Population patterns in India and the World; Distribution & structure of population, Population change causes & implications, demographic characteristics of population and their measures, population growth and development, natural growth and migration of population. Basics of population studies, source of demographic data, population structure and composition – age sex composition, sex ratio, dependency ratio, child-woman ratio; Measures of age–sex structure, age–sex pyramid. population projections, cohort analysis;

Unit IV Applied Economics**9**

Definition of economics - fundamental economic principles and concepts related to urban and regional planning; Basics of macro, meso and microeconomics, law of demand and supply- its relevance in planning; Goods, Market, factors of production; Economic concepts of land; Economic rent, land values, market mechanism and land use pattern. Employment mobility and analysis of distribution vis-a-vis place of residence; Economic base theory and techniques; economic development and growth indicators; economic growth vs development.

Unit V Socio-Economic aspects of Physical Planning**9**

Social mix and Urban neighbourhood Planning, communities and neighbourhoods, employment, housing and land use transformation; Urban rich, middle and poor and socio-spatial mobility; Children youth, women, aged and differently abled people and spatial planning; Social and economic Auditing and Social and economic Impact Assessment and urban development. Disaster, Resilience, climate change and socio-economic relevance of physical planning.

Total: 45 Periods**Outcome:**

- Exposure to concepts, theory and issues relating to socio-economic aspects in urban and regional planning

References:

1. Benjamin S (2008), Occupancy Urbanism: Radicalizing Politics and Economy beyond Policy and Programs, International Journal of Urban and Regional Research, Vol. 32.3, September, 719-729.
2. Brenner N and Theodor N (2002), Cities and Geographies of "Actually Existing Neoliberalism", Antipode, Vol. 34, Issue 3, 349-379.
3. De Souza M (2010), Which Right to Which City? In Defense of Political- Strategic Clarity. Interface, Vol. 2(1), May, 315-333.
4. Jan L, Christopher M. (2012), The Urban Sociology Reader. Routledge, London.

Second Semester

MTP121 - Transport Planning Studio-II	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorials per week	0
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objectives:

- This studio would provide a basic understanding of transport planning process, the data collection techniques for transport surveys and analysis of surveys to do a 4-step modelling using standard transport planning software. The aim would be to incorporate the transport model simulation in making transport plan of a city.

Module I: Traffic Laboratory and Software Applications

The intent of this course (being part of the studio) is to strengthen the capabilities of the students in use of various instruments available in transportation laboratory. In addition, the students will be trained in the field of GIS using standard software such as ARCVIEW, ARCGIS, etc. and use of standard transport planning and traffic engineering software such as TRIPS, CUBE, VISUM, VISSIM, TRANSCAD, TRANSYT, etc. to develop students' transport modelling capabilities.

Module II: Comprehensive Traffic and Transportation Plan for a City

The objective of this studio exercise is to train the students for the preparation of a comprehensive transport plan for a city. The modelling simulations learned through the first module will be applied in creating this plan. This exercise will involve field data collection on road networks, traffic, and travel studies, including household surveys, public transport studies, parking and terminal studies, etc. in addition to secondary data. The collected data will be analysed to assess the existing characteristics and identify various problems and issues. Travel demand models will be developed for the base year, and travel demand forecasts will be finalized based on alternate scenarios of development. Subsequently, a transport plan and proposals will be formulated including environmental aspects.

Total: 225 Periods

Outcomes:

1. Understanding different stages involved in preparation of transport planning.
2. Enhancing modelling capabilities using different transport software.
3. Capability to prepare comprehensive mobility plan for projected plan period.

References:

Daamen, W. et. al. (2017), Traffic Simulation and Data: Validation Methods and Applications, CRC Press, USA.
 Flaherty, C A O' (1996), Transport Planning and Traffic Engineering, CRC Press, USA.
 Ortúzar, J. De and Willumsen, L. G. (2011), Modelling Transport, John Wiley and Sons, United
 Indo Highway Capacity Manual, 2018

MTP122 – Geospatial Techniques for Transportation	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objectives:

- To equip with the concepts of geo-informatics and computing skills in the relevant software, associated scientific tools, and their relevance and applicability for transportation and infrastructure planning.

Unit I Basic Spatial Statistics**9**

Data exploration and spatial statistics for urban areas, evaluation, description and representation of spatial data quality, effect of inaccuracy on spatial data analysis. effect of data aggregation and disaggregation, MAUP (Modifiable Areal Unit Problem), Integration of spatial data of different quality Map matching. 3D volumetric analysis and modelling; Condition assessment of specific areas, Quantitative measurement of landscape surfaces; Vulnerability mapping and Monitoring, National Geospatial Policy.

Unit II Advanced Statistics**9**

Point pattern analysis: Point Sets and Distance Statistics, Nearest neighbour methods Hotspot and cluster analysis; Spatial autocorrelation and Spatial regression for urban phenomena; multi-criteria decision-making tools, land suitability analysis, Factor analysis; Cluster analysis

Unit III Information Systems for Transportation**9**

Transportation Information Systems (TIS), geo-spatial standards, data sources, issues, guidance and services for transportation and infrastructure planning; Intelligent Transport Systems (ITS) for traffic management; Advanced Transportation Management Systems (ATMS), Executive information system; Pavement management system, bridge management, maintenance management, safety management; toll modelling, simulation models; Corridor preservation and right-of-way, construction management; Hazardous cargo routing, overweight/oversize vehicles permit routing, accident analysis.

Unit IV Applications in Transportation Planning**9**

Application of standard transport planning and traffic engineering simulation software for travel demand modelling, Junction modelling, Emissions and dispersion modelling and Freight demand modelling, need and demand based software's such as AIMSPUM, VISSUM, CUBE, etc.

Unit V Project work**9**

To develop/submit lab based assignments and portfolios on application of geo-spatial techniques for transport related projects.

Total: 45 Periods

Outcomes:

Enhancing the knowledge and skillset for application of GIS tools in Transport planning.

References:

1. Cambell, J.B. (2002), *Introduction to Remote Sensing*, Taylor & Francis, London.
2. Jamwal, A.K. (2008), *Remote Sensing and GIS*, JnanadaPrakashan, Delhi
3. Jan Van Sickle (2010), *Basic GIS Coordinates*, Second Edition, CRC Press; 2ndEd., USA.
4. Richards, J.A. & Xia, X. (2006), *Remote Sensing Digital Image Analysis: An Introduction*, London.
5. Thill Jean-Claude (2000), Geographic Information Systems in Transportation Research, *Transportation Research Part C: Emerging Technologies*, Vol. 8, pp. 3-12

MTP123 - Highway Planning and Traffic System Design	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To equip with the knowledge on highway planning and traffic system design with respect to planning, design and management.

Unit I Highway Planning and Management**9**

Trends in highway planning and road development in country; classification of highways; locations and functions; planning approaches for rural roads, highway administration and finance; traffic surveys, alignment and route location, drainage studies, soil investigation, pavement design; overview of Highway Asset Management.

Unit II Highway Capacity and Geometric Design Elements**9**

Highway capacity fundamentals, norms for various types of highways; Cross sectional elements of highways- horizontal and vertical alignment, types of curves and their design – simple, compound, reverse, transition; sight distances along highways, principles of hill road design; intersections designs along highways, types of pavement, fundamentals of pavement design.

Unit III Traffic Flow and Capacity**9**

Road user and vehicle characteristics, fundamentals of traffic flow and relationship between the traffic flow variables Definition of capacity and level of service, factors affecting capacity and level of service, static and dynamic PCU, design service volume, capacity norms for urban roads with different widths, Level of Service; Macroscopic and Microscopic traffic flow models, fundamentals of queuing theory, models of delay at Intersections and Pedestrian Crossings.

Unit IV Design of Road Infrastructure System**9**

Design principles of intersections. Footway and pathway design - Criteria, network design principles, cross-section design, signage and marking, lighting and barriers; pedestrian precincts; Cycleway design - low cost bicycle supply and promotion; design criteria; classification; network design principles; cross-section design; signage and marking; bicycle parking facilities; Pedestrian and bicycle crossing facilities - crossing facilities; pedestrian crossing behaviour; crossing signals.

Unit V Traffic Management Systems**9**

Introduction to traffic control devices- signage's, markings, signals; Principles of Traffic Control, warrant for signals, Uncontrolled Intersection, Channelization, Traffic Rotary, Grade separated Intersection, principles of signal design; Evaluation of Traffic signal: Delay Models, Capacity and LoS Analysis of Signalised Intersections, phasing and inter green period, saturation flow, optimization of signals, Vehicle actuated signal facilities, co-ordination of traffic signal, area traffic control system; Traffic System Management (TSM) with IRC standards — Traffic Regulatory Measures.

Total: 45 Periods**Outcomes:**

- Understanding the fundamentals of highway planning and design.
- Apprehension of micro and macroscopic fundamentals of traffic system design.

References:

1. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski (2011), *Principles of Highway Engineering and Traffic Analysis*, Wiley India Pvt. Ltd., New Delhi.
2. Garber and Hoel (2010), *Principles of Traffic and Highway Engineering*, CENGAGE Learning, New Delhi.
3. Khanna. S.K., Justo. C.E.G. and Veeraragavan A. (2014), *Highway Engineering*, Nemchand Publishers, Delhi.
4. Tyworth, J. E. (1996), *Traffic Management Planning, Operations and Control*, Addison Wesley Publishing Company, USA
5. Roess, RP., McShane, WR. and Prassas,ES.(1998), *Traffic Engineering*,Prentice Hall.

MTP124 - Urban Transport Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To introduce various components of transport planning in urban areas and familiarize with transport planning methods.

Unit I Urban Transport and Land Use**9**

Urban activity systems, urban road structure, urban forms and structure and its impact on travel pattern, concept of accessibility and its impact on land use; urban structure and public transport, urban passenger transport system characteristics, public transport modes; urban freight transport; land use-transport cycle, Landuse-Transportation Models - Opportunity Models, Lowry Model; Transit Oriented Development (TOD).

Unit II Urban Transport Planning Process**9**

Types of Plans; Long Term vs. Short-Term Planning; Transport Planning Process, study area delineation and zoning, data needs and outputs; Data Collection Techniques, Transport surveys – Traffic and Travel Surveys, Network Surveys etc. Sampling Techniques, Expansion Factors, Accuracy Checks, quick response techniques for travel demand estimation; vehicle ownership forecasting.

Unit III Transport Demand Modelling**9**

Sequential and Simultaneous Approaches, Aggregate and Disaggregate Techniques, UTPS Approach; trip generation models, trip distribution models and its calibration, modal split models-measurement of choice, stated preference techniques, willingness to pay, stated discrete choice models- probit model, logit model; calibration of choice models, abstract mode choice, value of time, generalized cost, etc., traffic assignment techniques; calibration and validation checks; model testing and evaluation; travel forecasting, graph theory application in network analysis.

Unit IV Planning for Sustainable Transport**9**

Concepts of sustainability; Sustainable transport systems, NMT, public transport. Planning principles and process; Planning norms and standards; planning frameworks for NMT infrastructure improvements; Analytical methods - NMT site analysis; NMT network analysis. MT Facilities - Facilities on Highways and Primary Arterials, Designs based on Roadway function, Safety and Intersections; Local Street Design with respect to NMT; Financing NMT Infrastructure. Planning for NMT - Integration of NMT into transport master plans, PLOS framework, Case studies on sustainable transport projects.

Unit V Emerging Trends in Transportation Planning**9**

Big Data Analytics, conventional urban traffic planning and management methods vs big data; Machine Learning and the Internet of Things technologies in Transport Modelling and Planning.

Total: 45 Periods**Outcomes:**

1. Understanding the process of four stage travel demand modelling.
2. Apprehension of sustainable transport planning and its integration with land use and urban morphology.

References:

1. Dios Ortuzar J. (2001), Modelling Transport, Wiley, New York.
2. Cordera, R., Ibeas, A., dell'Olio, L. and Alonso, B., Land Use–Transport Interaction Models, CRC Press, 2018.
3. Hutchinson B.G., Principle of Transportation Systems Planning, McGraw-Hill, 1974.
4. Yang, D., & Duan, Z. (2022, September 19). Assessing Urban Transportation with Big Data Analysis. Springer Nature.
5. Papacostas, C. S., and Prevedouros, P. D., Transportation Engineering and Planning. 3rd Edition, Prentice - Hall of India Pvt. Ltd., 2015

MTP125 - Public Transport Planning	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To introduce various concepts of Public Transport and NMT, and how Public Transport and NMT can be integrated into the Transport Network.

Unit I Introduction to Public Transport Systems**9**

Urban passenger transport system characteristics, public transport modes, genesis of public transport system, mass transit system, Para transit system, technological features, Demand for public transport, public transport demand and supply indicators, public transport supply and demand characteristics in cities of various sizes and socio economic setting. Public transport based city forms and structure, Transit Oriented Development (TOD); Impact of city density, size, activity concentration.

Unit II Public Transport Network Planning and Operations**9**

Form, type and density of bus network and principles; Types of bus priority measures, merits and limitations, case studies; bus service planning: Network design, route design, frequency and headway determination, scheduling and time table, pedestrian –public transport interface, application of ITS services including Advanced Public Transportation Systems (APTS).

Unit III Public Transport Infrastructure**9**

Design of Bus stops/shelters, Depots, Terminals, multimodal interchanges; Bus stops –types and characteristics, planning guidelines; pedestrian-public transport interface, Bus Terminals – types, assessment of facilities and land areas for terminals; interchange- concepts, function and planning guidelines; bus depot -concepts, function, activity and land requirements, planning guidelines.

Unit IV Public Transport Performance and Economic Aspects**9**

Physical and financial performance indicators for public transport, performance characteristics of various public transport modes including para-transit modes, life cycle cost assessment, Public transport fare types and pricing criteria, costs, services; price elasticity of demand; subsidy issues; regulation, privatization impacts and integration issues on public transport performance; public transport financing; Alternate sources of financing, Accounting and Economic Profitability of Public Transport.

Unit V Feeder Systems**9**

First and last mile connectivity to mass transit systems, cycling, walking and para transit system; Types, function and role of para transit, planning principles, operation and maintenance of para transit systems; Institutional aspects and performance assessment.

Total: 45 Periods**Outcomes:**

- Knowledge of planning and design imperatives for public transport related infrastructure.

-
2. Sustainable strategies for enhancing public transport accessibility through last mile connectivity with NMT.

References:

1. Chakraborty and Das (2009), *Principles of Transportation Engineering*, PHI Learning, India.
2. Nash, C.A. (2007), *The Economics of Public Transport*, Longman, London.
3. Vuchic, V.R. (1981), *Urban Public Transportation Systems and Technology*, Prentice-Hall, Inc., USA.
4. White, P. R. (2003). *Public Transport: Its Planning, Management and Operation*. (n.p.): Taylor & Francis.
5. Dell'Olio, L., Ibeas, A., de Ona, J., de Ona, R. (2017). *Public Transportation Quality of Service: Factors, Models, and Applications*. Netherlands: Elsevier Science

MTIP1210 - Sociology and Transport Planning (Elective)	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To understand an overview of the various aspects related to the importance of sociological factor particularly the human and psychological dimensions of transport.

Unit I Sociological Principles**9**

Urban and rural Society; Social structure and physical pattern of rural and urban communities; Social Mobility, migration, and commutation; Urban and sub urban living and social mobility.

Unit II Social Aspects of Transport Sector**9**

Traffic as a social system; People, occupation and travel; Evolution and change in population mobility pattern; Mental and physical health and local and distance travel; Psychological impact of physical disruption; Social quality of urban roads, streets and public places; Barrier for mobility, Travel and mobility problems of diverse people: child, youth, women, elderly and differently able; Gender and Mobility, Equity and inclusiveness, Environment quality of urban streets and pedestrian safety; Sociology of car traffic in towns and cities; Stress, noise and pollution control; Evaluation of social impact of transport,

Unit III Contemporary Living Pattern of Mobility**9**

Historic and contextualized travel practices; Travel in technological culture; ICT based mobility innovations; Social features of smart transportation and smart mobility.

Unit IV Managing Transport and Society**9**

Rise and decline of public transport; Restructuring traffic facilities; Use of social research; Ideology and policy perspective of urban transportation; User friendly design of places for safe mobility and travel for all; Efficient transport plan; Participatory Planning Approaches, Management and control of the environmental impacts of transport systems in communities and cities.

Unit V Planning for Mobility of transport disadvantaged**9**

Transport disadvantaged groups, mobility needs of transport disadvantaged groups; planning principles and approaches of disadvantaged, differently-abled groups; Concept of accessibility; Best Practices.

Total: 45 Periods**Outcomes:**

- Understanding travel behaviour across different social groups and planning approaches for universal accessibility.

References:

- Boer Enne de (Ed.)(2011), Transport Sociology - Social Aspects of Transport Planning, Pergamon Press, Oxford.
- Government of India (2006), National Urban Transportation Policy, Ministry of Urban Development, New Delhi.
- Peters F.P.(2006), Time, Innovation and Mobilities: Travel in Technological Cultures, Taylor & Francis, UK

MTP1211 – Road Safety and Environment (Elective)	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To advance critical abilities to understand and solve real-world environmental impacts and effects stemming from transport network and infrastructure on the environment and propose ways in which the long-term development of transport can be made environmentally sustainable.

Unit I Road Transport and Environment 9

Elements of environment affecting the mobility of people and goods; Impacts of transport on environment –an introduction; Transportation and energy consumption; Vehicle emissions and trends; Effects of Vehicle Emissions; Transport dependent GHG emissions; Alternative fuels.

Unit II Transport and Road Safety 9

Road safety scenario, Collection and recording of accident data; Pillars for road safety systems approach; Star Rating of Road Network; Black Spot, Grey Spot Identification; Haddon matrix; Safety of vulnerable road users (VRU); Characteristics and environment of VRU's- Regulatory, Physical, Social; Safety in road design; Engineering and Non-Engineering measures; Accident Investigation, Analysis & Prevention; Countermeasures at Hazardous Locations.

Unit III Road Safety Audit 9

Introduction to Road Safety Audit (RSA) Approach & Methodology; Road Safety Audit at different stages of the project -Design Stage, Construction Stage, Pre-Opening Stage, Existing Stage; Road Safety Action Plan.

Unit IV Vehicular Pollution Modelling 9

Assessment of traffic related pollution- air and noise; Emission Inventory Techniques; Dispersion modelling approaches; Source Apportionment approaches; Basic definition of noise and measurements of Noise Level L_{10} , L_{50} , L_{90} , L_{EQ} ; Relationship between traffic flow and traffic noise; landuse planning and environmental noise.

Unit V Traffic and Environmental Impact Assessment for transport projects 9

Basic introduction to EIA; scoping and baseline studies; Impact of traffic on public health - accessibilities, active modes and health promotion; Impact of new road infrastructure; Road building materials and impacts; Manufacture and disposal of vehicles; Impact Prediction and Evaluation - NATA assessment methods, Analysis of Potential Environmental Impact and Mitigation Measures, Traffic Impact Assessment, Financial and Economic feasibility for transport projects.

Total: 45 Periods**Outcomes:**

- Understanding criticality of road safety and appreciate the needs of VRU's in developing safe environment.
- Understanding the impact of traffic on environment in terms of air and noise pollution and strategies for preparing environmentally sustainable transport plan.

References:

1. ASCI (2010), Environmental Impact Assessment Guidance Manual for Highways, Ministry of Environment and Forest, India.
2. Tiwari, G., & Mohan, D. (Eds.). (2016). Transport Planning and Traffic Safety: Making Cities, Roads, and Vehicles Safer (1st ed.). CRC Press. Taylor & Francis Group
3. Tiwary, A., & Williams, I. (2018). Air Pollution: Measurement, Modelling and Mitigation, Fourth Edition (4th ed.). CRC Press. Taylor & Francis Group
4. The Royal Society of Chemistry (2004), Transport and the Environment: Issues in Environmental Science and Technology, United Kingdom
5. IRC 104: Guidelines for Environmental Impact Assessment of Highway Projects, Ministry of Road Transport and Highways

MTP1212 – Smart Mobility (Elective)	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To provide a comprehensive overview of the intelligent transport systems (ITS) and traffic control systems for providing versatile and smart mobility solutions to cater future travel demand.

Unit I Smart Mobility 9

Concepts and components of smart mobility, role of ITS in smart mobility and smart cities; PPPs as a tool to implement smart mobility projects; smart mobility solutions for differently abled; Integration of smart and green mobility.

Unit II Intelligent Transport System 9

Definition, concepts, types of Intelligent Transport System (ITS); ITS technology, software, equipment, Traffic management, emergency and incident management, public transport system, terminal and depot management system, parking infrastructure management, commercial vehicle management, highway surveillance, case studies.

Unit III Application of ITS in Transport Systems 9

Advanced Traveller Information Systems (ATIS), including functionality, business models, field trip to Smart Route Systems; Advanced Transportation Management Systems (ATMS), including network operations, incident detection, congestion pricing, tolling, HOT lanes, example deployments; Fleet-oriented ITS services, including Advanced Public Transportation Systems (APTS), Commercial Vehicle Operations (CVO), Intermodal Freight, including International Operations and Supply Chains ITS and Technology, including automated highway systems (AHS); sensors, electronic toll collection (ETC); dedicated short range communication, and standards

Unit IV Performance, Implementation and Evaluation of ITS 9

Costing of ITS, ITS benefits assessment, economic and financial analysis of ITS. Implementation, case studies, Critical ITS Issues, including (as time permits) ITS and security; safety; human factors; privacy; sustainability; funding (as contrasted with conventional infrastructure); technology deployment/R &D/policy; other institutional issues.

Unit V Case studies on smart mobility 9

Application of ITS in-demand management, transport supply provision, shared mobility.

Total: 45 Periods

Outcomes:

- Knowledge on different ITS tools for managing transport demand and enhancing performance of transport system.
- Capability to perform financial and economic evaluation of different ITS related projects.

References:

- Button, K. J., Hensher, D. A. (2001), Handbook of Transport Systems and Traffic Control, Elsevier Science, United Kingdom.
- Sarkar, P., Jain, A.K. (2017), Intelligent Transport Systems, PHI Learning Private Limited, New Delhi
- Mashrur A. Chowdhury, and Adel Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, Inc., 2003.
- Ghosh, S., Lee, T.S. Intelligent Transportation Systems: New Principles and Architectures, CRC Press, 2000.

MTP1213 – Travel Behavior	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Overview:

This course will use a variety of theory from psychology, sociology, and behavioral economics to explain travel behavior and the circumstances under which it varies. You will investigate historical and emerging trends in travel behavior and lifestyles; understand how people make transport decisions using social psychological theories; and consider the design and implementation of behavior change interventions used in practice (including travel plans and other travel demand management measures).

Objectives:

1. Critically compare different theoretical models of travel behavior and identify their relevance to transport planning practice
2. Identify and analyze evidence on different international contexts where travel behavior change has occurred
3. Evaluate different approaches to travel behavior change and the evidence about their effectiveness
4. Design interventions based on travel behaviour change theories and evidence.

Unit I	Theoretical Models of Travel Behaviour	9
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Introduction to Travel Behaviour Theories

Introduction to Travel behaviour concepts, definitions, and terminologies, Various approaches of understanding travel behaviour; Overview of key travel behaviour theories: Theory of Planned Behaviour (Understanding intentions, attitudes, subjective norms, and perceived behavioural control), Normative Theories (Role of social norms and moral obligations in shaping behaviour), Utility-Based Models (Cost-benefit analysis of travel choices), and Habitual Behaviour Models (Influence of past behaviour and routines on current travel decisions) and relevance to transport planning

Critical Comparison of Travel Behaviour Theories

Strengths and weaknesses of different theories, Case studies illustrating the application of these theories.

Unit II	Travel Behaviour Modelling	9
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Taxonomy of travel behaviour modelling including algorithms, applications, data sources, technologies, analysis, models, and testing datasets; Challenges in Travel behaviour modelling

Unit III	International Contexts and Evidence on Travel Behaviour Change	9
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Travel Behaviour Change in Developed & Developing Countries

Case studies from developed and developing countries, Policy initiatives and their outcomes, identifying key factors influencing success or failure, Challenges and opportunities in different contexts.

Unit IV	Approaches to Travel Behaviour Change and Evaluation	9
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Educational and awareness campaigns (Role of information dissemination and public education in changing travel behavior), Incentive-based approaches (Financial incentives, rewards, and penalties to influence travel choices), Regulatory and policy measures, Quantitative and qualitative evaluation methods

Unit V Designing Behaviour Change Interventions

9

Applying theories to various transport system design interventions such as NMT Infrastructure design (Pedestrian, and bicycle facilities design), Public Transport system design (Route designing, scheduling, fare policies and incentives etc), Traffic System Management, Steps in designing a behavior change intervention

Total: 45 Periods

References:

1. Gärling, Tommy & Fujii, S.. (2009). Travel behavior modification: Theories, methods, and programs. *The Expanding Sphere of Travel Behaviour Research*. 97-128.
2. Sundling, C. Travel Behavior Change in Older Travelers: Understanding Critical Reactions to Incidents Encountered in Public Transport. *Int. J. Environ. Res. Public Health* **2015**, *12*, 14741-14763. <https://doi.org/10.3390/ijerph121114741>
3. Guell C, Panter J, Jones NR, Ogilvie D. Towards a differentiated understanding of active travel behaviour: using social theory to explore everyday commuting. *Soc Sci Med*. 2012 Jul;75(1):233-9
4. Moses Mwale, Rose Luke, Noleen Pisa, Factors that affect travel behaviour in developing cities: A methodological review, *Transportation Research Interdisciplinary Perspectives*, Volume 16, 2022, 100683, ISSN 2590-1982,

Third Semester

MTP211 - Transport Infrastructure Planning Studio	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objectives:

- To strengthen the capabilities of student in conducting feasibility studies using statistics and operation research of transport infrastructure of interurban/regions/special areas.
- To plan, design and institutionalize the transport infrastructure projects with concepts and strategies.

Unit I Application of Micro simulation

Various analytical quantitative techniques and methods for transport infrastructure; recent advancements in transport models; application of statistical and transport planning software, data requisition and survey methods; Structure and approach to feasibility studies. Micro-simulation using dedicated software packages

Unit II Detailed Project Report study on transport infrastructure planning, design and management for a case study

The objective of this studio exercise is to train the students for conducting a detailed project level study related to transport infrastructure planning, design and management aspects for a case study. This exercise will involve relevant field data collection besides secondary data collection. The data collected would be analysed to assess the existing characteristics and identify various problems and issues. Based on the scope of the study, alternate improvement, impact assessment, planning design and management strategies would be formulated and evaluated by taking into account costs and benefits; proposals and CBA.

Total: 225 Periods**Outcomes:**

1. Knowledge of macro and microscopic traffic system modelling by preparing DPR of transport projects.
2. Capability of carrying out financial and economic feasibility of transportation projects.

References:

1. Blonk, W.A.G. (1979), Transport and Regional Development. Saxon House, Farnborough.
2. O'Flaherty, C.A. (2000), Transport Planning and Traffic Engineering, Dept. of Transport, USA.
3. Ortúzar, J. De and Willumsen, L. G. (2011), Modelling Transport, John Wiley and Sons, United Kingdom.
4. Verma A. (2010), Integrated Public Transportation System: Planning and Modelling. VdmPublishing House, Mauritius.
5. Vinod K. T. M. (2000), Micro Regional Transport Planning / Research. School of Planning and Architecture, Delhi

MPIS212 – Research Methods	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To initiate the planning thesis by enabling students to identify a topic and then develop a proposal and methodology in detail besides providing them with the required theoretical inputs on the syllabus contents.

Unit I Introducing Research**9**

What is research? Types of research, basics of academic and applied research; Different approaches to research; Research philosophies – positivist and phenomenological philosophies. Introduction to elements of research: epistemology, theoretical perspective, methods, methodology; Justification of choice and use of methods and methodology; Paradigms in research.

Unit II Developing Thesis**9**

Research methodology: Quantitative – surveys, experimental, longitudinal, cross-sectional studies; Qualitative – case studies, action research, ethnography, participative enquiry, grounded theory. Content development - Developing contextual background; Research design; Identification of research problem; Research questions; Formulation of hypothesis; Writing aims, objectives, scope and limitations; Review of relevant literature; Identification of suitable research methods/ techniques/ instruments; Data collection – questionnaires, sampling techniques, observation, interviews; Analysis - qualitative and quantitative analysis, data synthesis; Research outcome – research findings

Unit III Research Ethics**9**

Prior permission and intimation, conduct of interview, asking right question, confidentiality, elimination of bias and suspicion; Roles and social responsibilities of the researcher; Time management in research.

Unit IV Field Work Plan**9**

Survey format preparation, study area identification and map preparation; Work plan schedule.

Unit V Research Communication**9**

Research vocabulary, Reading – notes taking, material organisation, indexing; Technical writing – content synthesising, paraphrasing, citation and referencing; Academic writing – research proposal / synopsis, abstract writing, report writing and mapping; Presentation: effective oral communication – content structuring, voice modulation, body language, audio-visual aids, hand-outs.

Total: 45 Periods**Outcomes:**

- Basic knowledge on research methods and techniques.
- Capability to formulate research design and proposal.

References:

- Crotty M. (2012), Introduction: The Research Process, the Foundations of Social Research, Meaning and Perspective in the Research Process. Sage Publications, New Delhi.

2. Frankfort, Nachmias, C., & Nachmias, D. (2008), Research Methods in the Social Sciences. Worth, New York.
3. Keith F. Punch (2013), Introduction to Social Research: Qualitative and Quantitative Approaches. Sage Publications, London
4. Neville, Colin (2007), An Introduction to Research and Research Methods. Effective Learning Services, School of Management, University of Bradford, United Kingdom

MTP213 - Logistics and Freight Distribution	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To provide a comprehensive overview of the main issues related to the increasingly important fields of freight transport, logistics and supply chain management (SCM) and all relevant aspects related to operations management.

Unit I Concepts of Freight, Logistics and Supply Chain**9**

Introduction to freight transport, types of freight transport systems- Maritime, air, rail, road and intermodal freight transport; Introduction to logistics and distribution, integrated logistics and supply chain, customer service and logistics, channels of distribution, role of 3PL and 4PL; blockchain in logistics; reverse logistics; key issues and challenges for logistics. Planning framework for logistics, logistics processes, supply chain segmentation, logistics network planning, logistics management and organisation, manufacturing and materials management.

Unit II Inventory planning and management**9**

Basic inventory planning and management, types, inventory costs; Performance Indicators; Inventory Control Methods; Replenishment models; Deterministic continuous review models: Economic order quantity (EOQ) model, Finite replenishment rate Inventory models; Multi-item EOQ model; Probabilistic inventory models.

Unit III Freight Demand Modelling**9**

Global, Regional and Local Freight Generation; Forecasting of freight trip generation; Modelling Inter-regional freight demand with Input–Output, Gravity and Spatial Computable General Equilibrium (SCGE) Models; Behavioural analysis of freight mode choice decisions; Multi-class traffic assignment; Aggregate and Disaggregate Models; route planning and scheduling freight transport; Use of GPS and Bluetooth Data for Freight Analysis; International best practices of freight models.

Unit IV Terminal and Warehouse Management**9**

Transportation Systems and Multimodal Transport; Need & Type of Terminals - Terminal Planning (Traffic Projection, Location, Layout), Terminal Activities; Design of freight terminals; Terminal Management & Operations; Telematics; Safety & Security aspects of Terminal; Principles of warehousing Flow, stock separation, unitisation, stock rotation; warehouse design; Storage and materials handling; Warehouse processes; warehouse management and information.

Unit V Freight distribution and management**9**

Principles of freight distribution, management of freight traffic, facility location models, Cost and distribution economics, performance monitoring, benchmarking, information and communication technology in freight distribution, security and safety issues; logistics and environment.

Total: 45 Periods**Outcomes**

- Knowledge on concepts related to logistics, inventory and warehouse planning.
- Application of operation and research techniques for freight routing and distribution.

References:

1. Rushton, A. et. al. (2010), The Handbook of logistics and Distribution Management, Kogan Page Limited, United Kingdom.
2. Waters, D. (2010), Logistics: An Introduction to Supply chain Management, Palgrave Macmillan, New York.
3. Tseng, Y. et. al. (2005), The Role of Transportation in Logistics Chain, Proceedings of the Eastern Asia Society for Transportation Studies, Vol. 5, pp. 1657 – 1672
4. Krajewski, L. J., Malhotra, M. K., & Ritzman, L. P. (2015). Operations Management. Pearson.
5. Ben-Akiva, M. E., Meersman, H., & Van De Voorde, E. (2013). Freight Transport Modelling. Emerald Group Publishing.

MTP214 - Transport Infrastructure Design	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To introduce planning strategies, design considerations and standards for transportation infrastructure.

Unit I	Road Infrastructure	9
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Design of roundabouts; Design of grade separated intersection and interchange; design of tunnel roads; Design of bus stops and shelters, bus bays; Parking facilities (surface and multi – level) layout design; design of pedestrian facilities (subways, foot over bridges);cycle tracks; NMT facilities.

Unit II	Rail Infrastructure	9
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Rail alignment surveys; Permanent way- rails, sleepers, ballast, sleepers; Curvature of track types of curves, degree of curvature, super -elevation, transition curves; railway points, crossings and junctions; station yards; terminals- size, parking, circulation, platforms, passenger service and amenities area; metro rail alignment and stations design elements.

Unit III Airports 9

Airport location planning; Components of airport design; Air side development – runways, taxiways, aprons, air and ground navigation and traffic control aids; Land side development – passenger building, cargo facilities, internal airport circulation and parking; Design of ground access facilities and airport support facilities etc.; land side airport connectivity planning.

Unit IV	Ports, Docks and Harbour	9
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Harbours - Types, layout, components of harbour- entrance, approach channel, turning basin, sheltered basin, breakwaters, wharves and quays, dry docks, Jetties and piers; Appurtenances to Harbour- Aprons, Transit Sheds, Warehouses, Moorings; Ports- types, components, Seaport location planning and land side connectivity.

Unit V	Multimodal Interchange	9
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Types of modal interchange, facility requirements for interchanges, international case studies and best practices for modal interchanges; components of modal interchange design, space standards, movement control, parking; design standards, access control design, mobility assistance.

Total: 45 Periods

Outcomes

1. Knowledge on planning and design considerations for infrastructure related to all different transport modes.

References:

1. Blow, C. J. (2005), Transport terminals and modal interchanges: planning and design, Elsevier, United Kingdom.
2. Kadiyali L. R (2016), Transportation Engineering, Khanna Publishers, New Delhi

MTP215 - Transport Economics	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	0
	Total Periods per Week	3

Objective:

- To impart basic understanding of economics associated with transport and infrastructure.

Unit I Introduction to Transport Economics**9**

Introduction: Basics of microeconomics such as demand and supply, and consumer surplus; Welfare Theory and Equilibrium Conditions, Goals and Objectives, Principles of Economic Analysis. Discounted Cash Flows: Analysis of User Costs and Benefits; Transport and the economy & transport and local economic development. Demand for transport; Factors influencing transport demand; Elasticity of demand, measures of elasticity; Supply and demand forecasting for transport.

Unit II Costing and Pricing of Transport services**9**

Allocation of Resources within Transport Sectors, Fixed and variable cost; Joint and common cost; Cost allocation; User cost internal cost, external cost, economic cost; Principle of pricing, marginal cost pricing; Price determination; Operational objectives of pricing; Revenues and subsidies.

Unit III Transport System Selection, Evaluation and Cost Analysis**9**

Framework of Evaluation, Transport Planning Evaluation at Urban and Regional levels, Other Evaluation Procedures – Financial and Economic Analysis, Achievement Matrices, Factor Profiles, Plan Ranking, Introduction to Mathematical Programming, Case Studies.

Unit IV Project Appraisal - Private Sector Participation**9**

BOT, BOOT, BOLT Projects - Project Planning - Project System Management - Project Implementation - Funds Planning - Budgetary and Control - Tendering and Contract - Value Analysis, Information System - Impact assessment, Project Report Preparation.

Unit V Regulation and Financing Transport Infrastructure**9**

Theory of regulation; Priorities in transport policies; Priorities in infrastructure policies; Regulatory reforms and coordination. Transport costing and financing sources, pricing principles, cost recovery pricing, deficits; Financial capital investment, , capital market/debt; Alternative Financing Mechanisms, Multilateral and Bilateral Financing mechanism, Financial Institutions, Private sector participation, land as a resource, public private partnership

Total: 45 Periods**Outcomes:**

- Knowledge of carrying out financial and economic evaluation of transportation projects.
- Understanding the role of financial institutions in transport sector.

References:

- Kenneth Button,, *Transport Economics*,, Edward Elgar Publishing Ltd, , 3rd Edition, 2010.
- Cole, S. (2005). *Applied transport economics: policy, management & decision making*. Kogan Page Publishers.
- Cowie, J. (2009). *The economics of transport: a theoretical and applied perspective*. Routledge. 2
- Kockelman, K., Chen, T. D., Kam, K. A., & Nichols, B. G. (2013). *The economics of transportation systems: A Reference for Practitioners* (No. 0-6628-P1).
- https://ctr.utexas.edu/wpcontent/uploads/pubs/0_6628_P1.pdf

MTP2110 - Port Planning (Elective)	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To provide the knowledge on types of ports, planning concerns of port areas, institutional arrangements for planning. The syllabus focuses on the preparation of spatial plans for port area plans with a special focus on port performance and commodity analysis.

Unit I Introduction**9**

Evolution of ports, role of ports in the economy, importance of trade and shipping industry, major ports, minor ports, land lard ports, coastal shipping, container shipping, IC terminals in India, glossary of port planning, regulatory framework of ports in India.

Unit II Port Infrastructure**9**

Port components; Ship size and cargo characteristics; Port Infrastructure for cargo handling and storage, marine access infrastructure, cargo specific berths and port facilities.

Unit III Port Master Planning**9**

Principles of Port Planning, Port connectivity, Processing and non-processing zones, institutional arrangements, Commodity analysis and requirements, transit efficiency parameters. Land requirements for port operations.

Unit IV Port and its impact on hinterland**9**

Evolution of port-city relationship, Any Port Model, port-city relationship; Traffic and Social impact assessment of port on hinterland; Captive and non-captive hinterlands assessment.

Unit V Case Studies**9**

Greenfield port, major and minor ports, port planning best practices.

Total: 45 Periods**Outcome:**

Knowledge on methodology for preparing Master Plan for Port areas focusing on commodity analysis and regional planning imperatives.

References:

- Daamen, T. Marcel V.G. (2006), Development challenges in the evolving port city interface, defining complex development problems in European main seaport-city interface: Rotterdam and Hamburg, International Association of Cities & Ports (Conference Paper).
- Ministry of Shipping (2016), Sagarmala, National Perspective Plan of Indian Ports, Government of India, New Delhi.
- Pedquera .M.A., Ruiz J.R. (1996), Sustainable Development strategies for cities and ports, United Nations (Monograph).
- Takel, R. E. (1983), Planning land use in port areas: getting the most out of port infrastructure, United Nations (Monograph).
- Thoresen, Carl A. (2003), Port designer's handbook: recommendations and guidelines, Thomas Telford, London

MTP2111 - Transport Infrastructure for Tourism Sector (Elective)	Subject Category	OE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- Understanding of tourism planning process, provision and production of infrastructure services in destination, departure, transit and arrival place.

Unit I Tourism Concepts, Theory, and practice 9

Introduction to Tourism – Concepts, theories, approaches and methods of tourism studies – Recreation, Leisure, travel and tourism - Types of tourism – Tourism regions – Tourism scenario - Tourist circuits – Tourism as Industry.

Unit II Determinants of Tourism Demand 9

People and travel habits – Tourist flow and tourism traffic analysis – Access to tourism: Gender, Age, Elders and differently able people - Environment responsive tourism – Tourism and environment sensitive areas- Tourism impact on environment – Disaster, pollution and tourism - Climate change.

Unit III Tourist Transport Modes 9

Rural and urban tourism – Modes of Travel - Hotel and hospitality services - Transportation networks and destinations – local public transport system - Walk ways, cycle tracks, para-transit modes and NMT, water ways, rope ways.

Unit IV Planning transport infrastructure for Tourism 9

Infrastructure planning for sustainable tourism: The social practices approach - The role of transport infrastructure in international tourism development: A gravity model approach - Tourism and international trade - Planning transport for special events - Tourism infrastructure: inequality and externality issues – Tourism Infrastructure support services – Travel safety and security – Walkways and informal sector; Transport Infrastructure in tourist precincts.

Unit V Transport Policies and Tourism Governance 9

Government and local community in creation of tourism infrastructure – Tourism policies and legislations - Tourism development and happiness: Residents' perspective - Collaborative tourism planning - Digital destinations - Destination branding: The role of consumer affinity.

Total: 45 Periods

Outcomes: Knowledge on tourism planning process and methodology for assessing transport infrastructure demand for tourism sector.

References:

1. Govt. of India, (2015), Tourism Policy of India, Ministry of Tourism, New Delhi
2. Jamal T and Robinson M, (2005), Introduction to Tourist Transport, Sage Publications, United Kingdom.
3. Khadaroo J, (2007), Transport infrastructure and Tourism development, Annals of Tourism Research, Vol.34. No 4 pp1021-2032.
4. Majumder, R, (2008) Infrastructure and Development in India, Rawat Publications, New Delhi.
5. Roday.S, Biwal.A. &Joshi.V, (2009), Tourism Operations and Management, Oxford University Press, London

MTP2112 - Transport Infrastructure Finance (Elective)	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To impart concepts related to transport infrastructure, mechanism and role of alternative financing mechanism and its relevance with the institutional framework.

Unit I Transport Infrastructure 9

Characteristics of transport infrastructure, Growth trends, Investment need and budgetary support, existing financing pattern, financial recurrent expenditure.

Unit II Transport Costing and Recovery 9

Transport costing, pricing principles, cost recovery pricing, deficits; financial capital investment, municipal development funds, capital market/debt.

Unit III Alternative Financing Mechanisms 9

Multilateral and Bilateral Financing mechanism, Financial Institutions, Private sector participation, land as a resource, public private partnership, and annuity based approach risk management.

Unit IV Institutional and Regulatory Framework 9

Risk management, financing institute, fund providers, role and function, documentation and agreement, institutional and regulatory framework implementation.

Unit V Case studies 9

Highways and urban roads, Mass transport systems, Passenger terminals (rail, bus, air), interchanges, Depots, Parking complexes, Logistics hubs etc.

Total: 45 Periods**Outcomes**

- Understanding the role of alternative financing mechanism along with the institutional framework.

References:

- A.Richard, Richard Hemming and H.Barry (2013), The International Handbook of Public Financial Management Center for aid and public expenditure, Hamburg, Germany.
- Allen .F, Yago.G (2013), Financing the Future, Market-Based Innovations for Growth, Pearson Publications, Indianapolis, Indiana.
- Athena Roumboutsos, Hans Voordijk, Aristeidis Pantelias (2018), Funding and Financing Transport Infrastructure, Rutledge Publications, New York, USA.
- Karl F Seidman (2012), Economic Development Finance, Sage publications, California, USA.
- Rondinelli. A (1990), Financing the decentralization of urban services in developing countries: Administrative requirements for fiscal improvements, Springer-Verlag publications, New York, USA

MTP2113 - Regional Transport Planning (Elective)	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To introduce regional elements in the domain of transport planning and equip students towards enhancing regional connectivity.

Unit I Overview of Regional Planning 9

Approach to regional planning, types of regions and their characteristics, delineation of region for transport planning; backwardness and regional disparity in development; role of connectivity and regional transport in development and backwardness.

Unit II Regional Transport Systems 9

Regional transport system, types, characteristics, regional transport supply, regional traffic and travel pattern, emerging issues.

Unit III Regional Travel Demand 9

Regional travel demand determinant, regional demand models, regional accessibility, sequential travel demand models, econometric models, regional public transport demand.

Unit IV Regional Network Analysis 9

Regional network system, rural road network planning, graph theory applications- connectivity and accessibility measures.

Unit V Regional Transport Policy 9

Regional transport infrastructure, system planning imperatives, integration aspects, system selection, policy aspects at regional level.

Total: 45 Periods**Outcomes**

- Understanding the regional context of transport planning and enhancing regional connectivity and accessibility using concepts of transport modelling and graph theory.

References:

- Blonk, W.A.G. (1979), Transport and Regional Development. Saxon House, Farnborough.
- Verma A. (2010), Integrated Public Transportation System: Planning and Modelling. Vdm Publishing House, Mauritius.
- Vinod K. T. M. (2000), Micro Regional Transport Planning / Research. School of Planning and Architecture, Delhi

MTP224 –Logistics Inventory Management	Subject Category	PE
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

1. Comprehend the importance of inventory management and gain a broad understanding of how inventory management fits into the broader function of logistics.
2. Develop the ability to independently construct new models and analytical tools for different problems by synthesizing and adapting the concepts, models, and analytical methods covered in the course.

Unit I Introduction to Inventory Management and Planning**9**

Definition of inventory, importance in supply chain management, Objectives of inventory management, Inventory classification: ABC analysis, XYZ analysis, FSN analysis, VED analysis. Inventory cost analysis: holding costs, ordering costs, stockout costs. Forecasting demand: quantitative and qualitative methods, time series analysis, causal methods.

Unit II Inventory Models and Optimization Techniques**9**

Deterministic models: EOQ model, EPQ (Economic Production Quantity) model. Stochastic models: Continuous review models (ROP – Reorder Point, s – Order-up-to level), periodic review models. Multi-echelon inventory systems: Distribution inventory, transportation inventory, pipeline inventory. Inventory optimization algorithms: dynamic programming, simulation optimization, genetic algorithms, heuristic methods. Inventory control in uncertain environments: stochastic demand, lead time variability, supply chain disruptions.

Unit III Inventory Performance Measures**9**

Key performance indicators (KPIs) for inventory management: inventory turnover ratio, stockout rate, fill rate, cycle time, carrying cost, Days Inventory Outstanding (DIO), Backorder Rate, Excess and Obsolete Inventory, Supplier Performance

Unit IV Inventory Control and Management Software Systems**9**

Just-in-Time (JIT) inventory management: principles, benefits, implementation challenges. Vendor Managed Inventory (VMI) systems; RFID and barcode technologies for inventory tracking and control. Overview of inventory management software systems as SAP, Fishbowl, WMS (Warehouse Management System), DEAR: features, functionalities, implementation considerations. Case studies on inventory management software in different industries.

Unit V Current Trends and Challenges in Inventory Management**9**

Sustainable inventory practices: green logistics, reverse logistics, circular economy principles. Inventory management in omni-channel retailing and e-commerce. Integration of artificial intelligence (AI) and machine learning (ML) in inventory forecasting and optimization.

Total: 45 Periods**Outcomes:**

1. Understand inventory management principles, methodologies, and optimization strategies for successful inventory planning, analysis, and control.
2. Gain practical skills in inventory planning, control systems, performance assessment, and supply chain integration to make educated decisions and drive continuous improvement in real-world businesses.

References:

1. Silver, E.A., Pyke, D.F., & Thomas, D.J. (2016). Inventory and Production Management in Supply Chains (4th ed.). CRC Press. <https://doi.org/10.1201/9781315374406>
2. Chopra, Sunil, and Peter Meindl. "Strategy, planning, and operation." *Supply Chain Management* 15, no. 5 (2001): 71-85.
3. Piasecki J. (2009): Inventory Management. A focus on forecasting, Lot sizing, Safety Stock and ordering Systems, 133.
4. Council of Supply Chain Management Professionals and Matthew, M. / Terry L. (2014): The definitive Guide to inventory management, Pearson Education LTD, 129-152.
5. Krajewski, L. J., Malhotra, M. K., & Ritzman, L. P. (2015). Operations Management. Pearson.

Fourth Semester

MTP221 - Transport Planning Thesis	Subject Category	SC
	Number of Credits	24
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	24
	Total Periods per Week	24

Objectives:

- To conduct independent scientific research on a topic of Transportation & Infrastructure Planning.

Each student of Planning (Transportation & Infrastructure Planning) course is required to undertake a terminal project on a subject related to Urban and Regional Transportation Development (Road, Rail, Port and Airport) concern preferably related to Travel behaviour, Land use and Accessibility, Travel demand forecasting modelling, Public transport system, Transportation Infrastructure Design and Management, transportation logistics Intelligent transport system, etc., as approved by the Department in the third semester in the course Advanced Research Methods.

The Thesis will provide an opportunity to the student to synthesize the knowledge and skills acquired through the learning of various theories and practices during the course and apply it for strategy formulation for a live planning challenge.

The students are required to select a topic of their choice in consultation with the faculty members and carry out the research based on primary and secondary data analysis / interpretation followed by identification of issues and potentials culminating in policies, plans and proposals or in proving the formulated hypothesis or research questions.

The Thesis shall be monitored continuously and periodically through internal marked review to check the consistency of work, the relevance of the analysis with respect to the data collected and project scope, and the progress towards logical proposals. The final output shall be firstly in the form of extended abstract, which once approved by the department will be followed by the submission of a detailed report and maps/visuals for external jury members, in a given format. The thesis shall also be presented orally in external jury by each student in the form of visuals / drawings for each topic.

Total: 360 Periods

Outcomes:

1. The final output shall be in the form of a draft report, which once approved by the department will be followed by the submission of a detailed report and drawing/visuals for external jury members, in a given format. The thesis shall also be presented orally in external jury by each student in the form of visuals / drawings as necessary for each topic.

MTP222 - Project Formulation and Appraisal	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- Introduce aspects of project planning, management, implementation, monitoring and appraisal.

Unit I Introduction to Project Planning 9

Concept of Project and Program, Prioritization of Projects and Programs, Nature and scale of Planning Projects, life cycle of a Project.

Unit II Project Formulation and Appraisal 9

Definition, Objectives, Importance of project formulation, Project appraisal and management; need of project appraisal, detailed project report, Feasibility studies; concepts of financial feasibility (Pay-back period, IRR, DCF, NPV, CBR), Methodology for project identification and formulation; financial cost-benefit analysis, social-cost benefit analysis

Unit III Project Management 9

Concept of project management, Stages of project form Network analysis; concept of CPM, PERT, resource levelling and allocation, time-cost trade off aspects; Bar charts, Milestones, Techno-economic analysis of projects.

Unit IV Project Implementation 9

Project implementation, stages of implementation, actors in project implementation; Project monitoring techniques, integrated reporting, Milestones, time and cost overrun and under runs, unit index technique.

Unit V Project Evaluation and Monitoring 9

Project evaluation: Life of a project; Stages, approach and steps, techniques of project evaluation: input analysis, UNIDO Approach methods; Case studies in Transportation and Infrastructure development projects.

Total: 45 Periods**Outcomes**

1. Apprehension of project planning and management specific to transport sector.

References:

1. Awani, Alfred O. (1985), Project Management Techniques, Petrocelli Books, New York, USA.
2. Chandra, P. (1995), Projects: Planning, analysis, selection, implementation and review, Tata McGraw Hill publishing, New Delhi, India.
3. F.Lawrence Bennett (2003), Management of Construction: A Project Lifecycle Approach, Butterworth Heinemann, Portsmouth, USA.
4. Kerzner, H. R. (2013), Project Management: A Systems Approach to Planning, Scheduling, and Controlling, John Wiley & Sons, New York, USA.
5. Lester, A. (2007), Project Management, Planning and Control, Butterworth Heineman publishing house, Portsmouth, USA.

MTP223 - Transport Policy and Governance	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- To introduce the students to Transport Policy, Legislation and Institutional Framework.

Unit I Introduction to Transport Policy Making 9

Basic concepts of policy, strategy and tactics, fundamentals of transport policy, theoretical and historical perspectives; principles of transport policy making at local, national and international level.

Unit II Transport Sector Policies 9

National transport policies in sectors of road sector, Road transport, railways, civil aviation, ports and shipping; financial outlays in transport sector; National urban transport policy (NUTP); urban bus service provision policies, MRTS policies, NMT policies, Logistics and freight sector policies; PPP in transport sector; International and national case studies on best practices in urban, regional and national transport policies.

Unit III Transport Legislation and Acts 9

Road Transport Corporation (RTC) Act, Motor Vehicle Act, National Highway Act; Legislations in Railways, Civil Aviation, Ports sector, Logistics sector, Multimodal Transport Act etc.

Unit IV Institutional Frameworks in Transport Sector 9

Institutional set ups in Roads, Road transport, Railways, Civil Aviation, Ports and Shipping, Metro Rail Corporations, State Road Transport Undertakings .City Bus Undertakings; Urban Transport set up in Municipal Authorities, local bodies etc.; UMTA; Special Purpose Vehicles (SPV's), Role of NGO's etc.; innovative methods in institutional strengthening, institutional audit and capacity building.

Unit V Case Studies 9

A review of regulating policies and case studies on national, state and regional policies and governance implications of these policies.

Total: 45 Periods**Outcomes:**

- Apprehension of various transport policies and there relevance in transportation.
- Understating the importance of legislation and governance for transport sector.

References:

- Planning Commission National Transport Development Policy Committee (2014), India Transport Report: Moving India to 2032. Government of India.
- MoUD (2006), National Urban Transport Policy. Government of India.\
- O'Flaherty, C.A. (2000), Transport Planning and Traffic Engineering, Department of Transport, USA

Master of Architecture

(Architectural Conservation)

Course Structure and Detailed Syllabus for
Two-Year Masters Degree Programme in Architecture

Effective from the Academic Year 2024-25 onwards

(As Approved by Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाडा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA.



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School of Planning and Architecture, Vijayawada
An Institute of National Importance, Ministry of Education, Govt. of India

Introduction to
Master of Architecture (Architectural conservation)

Traditional knowledge systems embedded in the architectural heritage of India is a rich examples of sustainable living ethos. Protection and conservation of its vast and diverse heritage has been identified as constitutional obligation as well. Master of Architecture (Architectural Conservation), abbreviated as M.Arch (AC), is a master's degree course in Architecture offered by School of Planning and Architecture, Vijayawada. It offers specialisation in Architectural Conservation.

The key objective of the course is to develop a deeper understanding of this cultural phenomenon and its association with integral development of the settlements. A comprehensive and integrated conservation management and to equip the students with adequate skills required to comprehend various aspects that are the determinants of the heritage in all the contexts. The course is designed to provide necessary exposure to various approaches in understanding, assessment and make necessary interventions of heritage components ranging from archaeological sites to urban settings.

SPAV's Architectural Conservation – Post Graduation programme is one of its kind in the southern part of the country. The course curriculum is based upon the changing realities of heritage conservation in India and the world. As a student here, one becomes part of a dynamic learning environment with accomplished faculty of the institute as well as expert from leading institutions and industry in conservation field. SPAV aims to create an environment to make this course more learning centric rather than curriculum centric by promoting social engagement, right-based approaches to management of heritage, fostering critical thinking and integrating conservation experiences inside and outside the studios.

The Programme

The programme is divided into five modules namely: **Module**

Critical approaches

Focuses on different understanding of heritage components by the parallel and allied fields based upon distinct methodologies. It builds a foundation of understanding archaeological, social and anthropological etc. as basis to develop a comprehensive architectural heritage education. It also explores and addresses the changing paradigms in heritage ranging from values to economics

Diagnostic tools

Focuses on information collection to management systems. The tools developed would be specific to observation, recording, representation that would be key for assessment with a scientific basis for heritage management. State of art technological tools would be introduced for heritage documentation.

Heritage assessment

Focuses on various assessment both qualitatively and quantification of heritage components in various contexts and scales. The objective of this module is to develop scientific basis for interventions.

Theory and Principles

Focuses on the administrative, political and legal frameworks under which the conservation works are undertaken. It forms a philosophical base on which the interventions are decided.

Studios

First Hand Experience on various scales of Heritage contexts/projects.

The syllabus is designed so as to develop strong communication, interpersonal, advocacy and analytical skills of the student. The subject faculty members are encouraged to assess the students in a progressive manner throughout the semester through seminars, group/individual presentations/Assignments, written exams, report submissions, viva voce, etc.

First Semester

Code	Course Titles	Distribution of Periods per week			Total Periods Per Week	Credits
		L	T	S/P		
MACO111	Conservation Studio-I	3	0	12	15	15
MACO112	Introduction to Conservation; History, Principles and Practice	3	0	0	3	3
MACO113	History, Theory and Criticism in Heritage Studies	2	0	0	2	2
MACO114	Methods of Heritage Research, Documentation and Interpretation	2	0	1	3	3
MACO115	Conservation Methods and Materials - I	2	2	0	4	4
MACO116	Skill enhancement for Conservation	2	0	1	3	3
	TOTAL:	14	2	14	30	30

Second Semester

Code	Course Titles	Distribution of Periods per week			Total Periods Per Week	Credits
		L	T	S/P		
MACO121	Conservation Studio-II	3	0	12	15	15
MACO122	Conservation Approaches & Philosophies	3	0	0	3	3
MACO123	Knowledge Systems in Heritage Studies	2	0	0	2	2
MACO124	Research Methods & Report Writing in Heritage Studies	2	1	0	3	3
MACO125	Conservation Methods and Materials – II; Conservation Lab	2	1	1	4	4
MACO126	Conservation of Cultural Landscapes, Historic Towns and Cities	3	0	0	3	3
	TOTAL:	15	2	13	30	30

Third Semester

Code	Course Titles	Distribution of Periods per week			Total Periods Per Week	Credits
		L	T	S/P		
MACO211	Conservation Studio-III	3	0	12	15	15
MACO212	New Paradigms in Conservation	3	1	0	4	4
MACO213	Heritage and Jurisprudence	3	0	0	3	3
MACO214	Conservation Economics and Finance	2	1	0	3	3
MACO2110	Elective: I Heritage Impact Assessment	2	0	1	3	3
MACO2111	Elective: II Disaster Management of Cultural Resources					
MACO2112	Elective: III Decolonising Museums and Heritage					
MACO217	Summer Internship (6-8 Weeks)	0	0	0	0	2
	TOTAL:	13	2	13	28	30

Fourth Semester

Code	Course Titles	Distribution of Periods per week			Total Periods Per Week	Credits
		L	T	S/P		
MACO221	Conservation Thesis	6	6	12	24	24
MACO222	Heritage Management Seminar	2	1	0	3	3
MACO223	Interventions at Historic Buildings	2	0	1	3	3
	TOTAL:	10	7	13	30	30

MACO214 is to be read as:

M = Masters of; ACO= Architectural Conservation; 2 (1st digit) = 2nd Year; 1 (2nd digit) = 1st Semester; 4 (3rd digit – 1 to 9) = 4th Subject

MACO2111 is to be read as:

M = Masters of; ACO= Architectural Conservation; 2 (1st digit) = 2nd Year; 2 (2nd digit) = 2nd Semester; 12 (3rd digit if 10 Onwards) = 2nd Elective

Note: Credits for each subject are the same as the number of lecture / practical hours per week, whichever is higher.

Detailed Syllabus

for

Master of Architecture

(Architectural Conservation)

FIRST SEMESTER

MACO111 - Conservation Studio-I	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objectives:

- The objective of the first semester studio is to introduce the students to the fundamentals of heritage sites through various training modules and through a studio exercise with a focus on documentation of heritage.

Basics/Foundation (Three Week): Orientation to the subject of Architectural Conservation. Fundamentals of site, context, historicity.

Observation & Enquiry (Two Week) Training to observe and making enquiry of a heritage building / monument. Introduction to the concept of archival research. Exercises to inculcate critical thinking.

Fieldwork & Measure Drawing (Two Week) Exercise of measure drawing a small-scale structure. Focus on manual documentation techniques and translating site sketches/drawings to presentation drawings.

Understanding a heritage building (Five Week) Developing an understanding regarding varied aspects of a heritage building - building types and typologies, materials, construction systems, architectural influences etc.

Associated Intangible Aspects (Three Week) Deciphering the intangible aspects of heritage sites; people, communities, culture and practices.

***Site Visit and Documentation Project (Ten Days):** Detailed documentation of the identified historic heritage building/site by studying the physical, socio-economic, environmental and governance aspects. Understanding its setting, significance and determinants that shaped the building. Special lectures/onsite demonstrations on application of different tools shall be conducted by subject experts/Local resource persons.

Deliverables shall include drawings and report. Progressive presentations shall be made for reviews at various stages.

Total: 225 Periods

Outcomes:

Students finishing this course will be able to:
Study and understand historic heritage buildings and sites.

** The criteria for the selection of the site/building for the documentation is significant historic heritage/ material culture. Distinct layers of heritage components shall be identifiable with a potential case for conservation. Accordingly, two weeks itinerary shall be prepared to explore hands on experience with the help of local resources/experts on various tools and techniques in documentation, investigations, and assessment.*

MACO112 - Introduction to Conservation; History, Principles and Practice	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- The objective is to introduce conservation movements in India and Abroad and to examine various precursors and their relevance with the context. It critically examines various international standards, indigenous practices and relative case studies.

Unit I Introduction-History, origins, theory and principles of Architectural Conservation**9**

Broad narrative-(Western Context) Origin and early phase of Conservation, European Movement, Major thinkers/pioneers of Conservation, fundamental principles and philosophy-its evolution, Idea of restoration and preservation as a part of European culture, recognized cultural resources,(Indian Context) Origin and early phase of conservation, scholarly publications, records, cartographs, archaeological excavations, formulation of Asiatic Society of Bengal, museology, conservation of antiquities and artefacts, Practice of formal Conservation initiated - set up ASI, Major contributors/pioneers ,ideologies and philosophies, concept and practice of conservation, Acts and laws pertaining to heritage.

Unit II Global context and levels of Management for Conservation**12**

Key roles of International, National, Private Bodies, conventions, recommendations, charters from Venice to Mexico, (Special focus on Indian Context.)

Unit III Vocabulary to understand Architectural Conservation**9**

Definition, terminologies in conservation; historicity, values, authenticity, preservation, restoration, transformation, conservation etc. including traditional vocabularies for conservation.

Unit IV Legislative framework for Conservation in India**6**

Article 49 of Constitution of India, understanding the works and systems of ASI, State Governments and Private organizations dealing with conservation, UNESCO ratification, Acts

Unit V Practices of Architectural Conservation in Contemporary India**9**

Present context in Heritage. Assessing architectural character- the concept of *Jeernodhara*, *Kumbhabhishekam*. Craft & conservation – intangible heritage.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Understanding the needs of heritage conservation and development towards a sustainable future.

References:

- India, A. S. O., & Marshall, J. H. (1923, January 1). Conservation Manual.
- Evans, N. L. (2019, July 25). An Introduction to Architectural Conservation. Routledge.
- Jokilehto, J. (2017, October 20). A History of Architectural Conservation. Routledge.
- Biswas, S. S. (1999, January 1). Protecting the Cultural Heritage.
- Richmond and Bracker, eds. (2009, Aug 8) *Conservation: Principles, Dilemmas, and Uncomfortable Truths*, Oxford.
- Cumming, J. (2006). Revealing India's Past. Hesperides Press.
- Feilden, B. (2003). Conservation of Historic Buildings (3rd ed.). Routledge. <https://doi.org/10.4324/9780080502915>
- Orbasli, A. (2008). Architectural conservation: Principles and practice. Printdisabled; Internetarchivebooks.

MACO113 - History, Theory and Criticism in Heritage Studies	Subject Category	TC
	Number of Credits	2
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	2

Objective:

- The objective is to help students develop critical thinking skills intended for greater understanding of architectural history. It emphasizes on analysis and interpretation of various sources, and encourages students to adopt new ways of seeing the history of architecture.

Unit I Historiography**6**

Ways of Understanding political and cultural history. Historiography, writers of history, of art and architecture and their interpretations. Types of Historiographical writings

Unit II Development of architectural history as a subject**6**

Historic architecture, oral history and living traditions as a source of knowledge; from 'stylistic' analysis to knowledge systems approach. Introduction to architectural history, theory, and criticism. Development of architectural history as a subject

Unit III Introduction to National and International Charters**6**

Understanding linkage between philosophy, history, theory and practice in architecture and conservation. Relationship between idea and interpretation.

Unit IV Analysis of Architectural Idioms**6**

Analysis of architectural idioms. Hybrid architecture and building of no idiom

Unit V Appreciation and Criticism**6**

Difference between review, appreciation and criticism. Relationship between criticism and practice. Techniques of appreciation and criticism. Appreciation and criticism as a tool to provide feedback. Writing appreciation and criticism.

Total: 30 Periods**Outcomes**

Students finishing this course will be able to:

Critically evaluate various sources of architectural history and theory to develop an appropriate framework to rediscover the regional architectural heritage

References:

- Basu, P. P., & Chanda, I. (2011). Locating Cultural Change. SAGE Publications Pvt.
- Urban Culture: Critical Concepts in Literary and Cultural Studies. (2004). United Kingdom: Routledge.
- Arnold, D., Ergut, E. A., & Ozkaya, B. T. (2006). Rethinking Architectural Historiography. Routledge.
- Ockman, J. (1985). Architecture, Criticism, Ideology.
- Wallenstein, S. O. (2016). Architecture, Critique, Ideology: Writings on Architecture and Theory. Axl Books.
- Heller, G. N. (1999). Book Review: History in Crisis? Recent Directions in Historiography. The Bulletin of Historical Research in Music Education, 20(3), 209-212.
- Wood, G. S. (2009). The Purpose of the Past, Reflections on the Uses of History. Penguin.
- Breisach, E. (2008). Historiography: Ancient, Medieval, and Modern. University of Chicago Press.

MACO114 - Methods of Heritage Research, Documentation and Interpretation	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

- The objective is to expose the students to various modes and techniques in organizing data including manual documentation/inspection recording systems.

Unit I Data collection and recording for heritage/historic sites- Methods and Principles

9

Difference between data and information. Ways of collecting information- historical documents, photographs, maps, and other records related to the heritage site. Understanding and need for documenting different types of heritage components. Information processing in heritage areas, Open-source geospatial platform for heritage inventories: the Arches Project, Use of GIS for heritage resource management in India (Delhi, Bengal, HRIDAYA, SMART Cities) & Abroad.

Unit II Manual Documentation Techniques

9

Introduction to various methods and principles of documentation with special focus on manual surveying and documentation techniques. Understanding of scales and measurements, types of instruments and their uses specific to heritage sites. Standards of documentation. Methods of demography and population studies – population projections, introduction to Census data and sale surveys.

Unit III Application and use of tools

9

Appropriate documentation techniques of various scales and components of cultural resources. Tools used for documentation and recording-inventory, survey questionnaires etc. Errors in measurement and corrections, recording field notes and obstacles in surveying. Methods of organizing site data. Application of documentation techniques.

Unit IV Photogrammetry

9

Fundamentals of Photogrammetry, need and applicability in documentation of heritage sites, Principles; Camera position, focal length, image orientation, relative camera positions, Length and angle units, required software and data. Photogrammetry data analysis for visual exploration, Use of Aerial Mapping and Photogrammetry techniques analysis, synthesis and graphic presentation of Aerial mapping data regarding heritage resource management in historic urban and cultural landscapes

Unit V GIS and its applications in Heritage Studies

9

Introduction to DEM, Terrain Mapping and Analysis. Basic elements of GIS modelling, Heritage applications of 3D Modelling Tools – Geocoding & Dynamic Segmentation for Data management, data display, data query and data analysis. Heritage applications of 3D Modelling Tools, Introduction to LiDAR, Remote sensing Techniques.

Total: 45 Periods

Outcomes

Students finishing this course will be able to:

Learn various methods of data collection using various tools and techniques.

References:

- Linder, W. (2009). Digital photogrammetry (Vol. 1). Berlin/Heidelberg, Germany: Springer.
- Arayici, Y., Counsell, J., Mahdjoubi, L., Nagy, G. A., Hawas, S., & Dweidar, K. (Eds.). (2017). Heritage building information modelling. Taylor & Francis.
- Swallow, P., Dallas, R., Jackson, S., & Watt, D. (2016). Measurement and recording of historic buildings. Routledge.
- Cooper, N. (1990). Guide to recording historic buildings. Guildford (United Kingdom): Butterworth Architecture.
- Bold, J. (2009). Guidance on inventory and documentation of the cultural heritage. Council of Europe.
- Terras, M. (2008). Digital Heritage: Applying Digital Imaging to Cultural Heritage. Lindsay MacDonald (ed.).
- Hemsley, J., Cappellini, V., & Stanke, G. (Eds.). (2017). Digital applications for cultural and heritage institutions. Routledge.
- Krygier, J., & Wood, D. (2016). Making maps: a visual guide to map design for GIS. Guilford Publications.
- Agor, R., (2002, 1 january). Advanced Surveying, A text book, Khanna Publishers.
- Watt, D., Swallow P., (1996). Surveying Historic Buildings, Donhead.
- UK, I. (1990). Guide to recording historic buildings.
- Sykes, M. H. (1984). Manual on systems of inventorying immovable cultural property.
- Lee, E. S., & Forthofer, R. N. (2005). Analyzing complex survey data. Sage Publications.
- Krygier, J., & Wood, D. (2016). Making maps: a visual guide to map design for GIS. Guilford Publications.
- Datta, S., & Beynon, D. (2016). Digital archetypes: adaptations of early temple architecture in South and Southeast Asia. Routledge.

MACO115 - Conservation Methods and Materials - I	Subject Category	TC
	Number of Credits	4
	Lecture Periods per Week	2
	Tutorial Periods per Week	2
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	4

Objective:

- The objective is to understand the traditional materials, their behaviour and changes due to various atmospheric elements.

Unit I Introduction to historic building materials 12

Introduction to historic building materials: location, formation, physical and chemical properties and sourcing of historic building materials. Characterization of materials and compatibility of its usage with modern materials. Relationship between various historic building materials and historic buildings.

Unit II Maintenance requirements of building materials 12

Maintenance requirements of building materials. Diagnosis and assessment of defects in building materials by atmospheric elements. Remedial measures. Strengthening of building materials. New building materials.

Unit III Preparation of conservation specifications 12

Preparation of conservation specifications. Laboratory testing of materials for material and structural analysis to support sensitive interventions.

Unit IV Traditional and Historic Building Materials 12

Introduction to traditional and historic building materials and construction vocabularies in different cultural regions of India. Case studies of the same.

Unit V Identification and diagnosis of defects 12

Identification of materials and structural building system typologies Inspection, condition assessment and diagnosis of material and structural defects.

Total: 60 Periods**Outcomes**

Students finishing this course will be able to:

Acquire knowledge of traditional materials and their behaviour and workability.

References:

- Durbin, L. (2012). Architectural Tiles: conservation and restoration. Routledge.
- Kumar, A. V. (2001). Conservation of Building Stones.
- Daniels, K. (1998). Low-tech, light-tech, high-tech: Building in the information age
- Cowper, A. D. (1998). Lime and Lime Mortars. 1927. Reprinted edition. Dorset, England: Donhead Publishing.
- Forsyth, M. (Ed.). (2008). Materials & skills for historic building conservation. Blackwell Pub.
- Rai, G. S., Desarkar, P., Center, L., Initiative, C. R. C., & Trust, I. U. (2006). *What are Lime Mortars*
- Bais, S. (2007). Why Use Lime, Conservation briefs. Intach UK Trust

MACO116 – Skill Enhancement for Conservation	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

- The objective is to hone fundamental communication and representation skills to effectively communicate ideas and challenges.

Unit I Introduction to techniques of Communication**12**

Introduction to different ways and effective techniques used for graphic, written and verbal communication in different stages and aspects in the field of heritage conservation. Learning the aesthetic, technical and conceptual techniques which are essential for the creative outcome, enabling students with skills and tools to solve complex problems.

Unit II Drawing for Understanding**9**

Drawings as efficient and powerful analytical tools. Introduction to the various types of interpretative illustration that will enhance the understanding of historic buildings and cost-effective methods of making them.

Unit III Reading and Making Maps**9**

Map making through the ages, evolution of representation of urban form. Application of Geo-Spatial Data and GIS tools with integration of cartography and historic maps to generate base maps, image analysis and exploratory data analysis for visual exploration, analysis, synthesis and graphic presentation of geospatial data regarding heritage resources.

Unit IV Graphical Representation Tools**6**

Experimenting with effective representation of ideas through the creative use of drafting softwares. Communicating documentation including technical skills and competence.

Unit V Report Writing & Verbal Communication**9**

Verbal Communication- through Extempore and debates. Written Skills- Report writing in the field of conservation. Write persuasive arguments probably stemming out of the Studio exercise, well-structured text and express critical standpoints.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Effectively communicate ideas and challenges in the field of conservation.

References:

- Bruckle, I. (n.d.). The Development of Skill Knowledge in Conservation.
- Cameron, C. (n.d.). Evolving Heritage Conservation Practice in the 21st Century.
- Caple, C. (n.d.). Conserving Skills:Judgement,Method,Decision Making.
- Catherine Croft, S. M. (n.d.). Concrete:Case Studies in Conservation Practice(Conserving Modern Heritage).
- Forsyth, M. (n.d.). Material and Askills for Historic Building Conservation.
- Jacobson, S. K. (n.d.). Conservation Skills for Conservation Professionals.

SECOND SEMESTER

MACO121 - Conservation Studio-II	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objective:

- The objective of the second semester studio is to introduce the students to the problems and issues confronting historic heritage buildings and sites through an interdisciplinary approach, achieved by wherever possible, through a studio exercise.

Archival Research (Three weeks): Search and review of relevant literature and sources related to heritage building/monument, period, style, and historicity.

***Site Visit and Documentation (Two weeks):** Detailed documentation of the identified historic heritage building/site by studying the physical, socio-economic, environmental and governance aspects. Understanding its setting, significance and determinants that shaped the building. Special lectures/onsite demonstrations shall be conducted by subject experts/Local resource persons.

Analysis (Five weeks): Analysis and Identification of the important issues with respect to material, construction, style, morphological aspects, transformations. Identifying various threats due to natural or man-made causes of defects/deteriorations and various degrees of its condition assessment.

Conservation Proposals (Five weeks): Based upon identified issues the suitable conservation proposals for various aspects of protection to historic heritage building/site.

Deliverables shall include drawings and report. Progressive presentations shall be made for reviews at various stages.

Total: 225 Periods

Outcomes

Students finishing this course will be able to:

Study and find solutions to problem and issues confronting historic heritage buildings and sites.

**The criteria for the selection of the site/building for the documentation is significant historic heritage/ material culture. Distinct layers of heritage components shall be identifiable with a potential case for conservation. Accordingly, two weeks itinerary shall be prepared to explore hands on experience with the help of local resources/experts on various tools and techniques in documentation, investigations, assessment, and development of conservation strategies.*

	Subject Category	TC
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MACO122 - Conservation Approaches & Philosophies	Number of Credits	3
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- The objective is to understand the approaches by other discipline like archaeology, anthropology, history etc. to critically derive a scientific approach towards developing methods in architectural conservation.

Unit I Core Disciplines & Perspectives**9**

Introduction to various core disciplines including Social Sciences (Anthropology, Sociology, History, Art- History, etc.), Archaeology and Planning. Role of archaeologist and planners in heritage conservation. Research methods and perspectives in various core and allied disciplines.

Unit II Inter-disciplinary Techniques**9**

Importance of core disciplines in holistic understanding of conservation. Impacts of core disciplines on Conservation. Urban Planning objectives and introduction to urban planning terminologies, Type of plans and plan hierarchies, Integration of conservation in Master plans, Zonal plans and Local area plans, URDPI Guidelines, Understanding planning provisions with specific focus on heritage. Region as comprehensive physical planning unit: concepts, criteria for identification, types: planning region, resource region, cultural region etc. The theory of regional settlement patterns, urban – rural continuum and changing relationships. Delineation of city regions: Greater London Plan, NCR, District planning processes in India.

Unit III Value Assessment**9**

Introduction to Value Assessment in conservation. Intrinsic and extrinsic values of architectural heritage and how these impact various interventions in their context. Methods and tools of Value Assessment by allied disciplines. Different Approaches and Methodologies to study Culture.

Unit IV Historic urban landscapes approach**9**

Concept of urban sustainable development, Urban and territorial management based on the proposition of integrated conservation Historic urban landscapes approach: Urban conservation as an interdisciplinary and multidisciplinary process. History of integrated territorial urban conservation approaches in the world with select examples: York, Chester, Bath, Bologna, Ferrara, Cairo.

Unit V Integrated Methodology**9**

Evolving holistic and integrated habits of thought by understanding architectural conservation theory, its evolution, direction, current debates, and possible future trajectory. Approaches to integrated conservation in India with select examples explaining urban conservation tools and methods: Inner city regeneration, adaptive reuse, infill development etc. Institutional framework for urban conservation and renewal strategies in India.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Develop a multidisciplinary approach towards developing various conservation frameworks

References:

- Feilden, B. M., & Jokilehto, J. (1998). Management guidelines for World Cultural Heritage sites
- Thakur, N., Kawathekar, V., Chandra, S., & Kodasi, S. (2002). Campaign Authenticity: a series of workshops, SPA Delhi.
- Lemaire, R., & Stovel, H. (1996). The Nara Document on Authenticity: Nara Conference on Authenticity in Relation to the World Heritage Convention.
- ICOMOS, A. (2013). The Burra Charter: The Australia ICOMOS charter for places of cultural significance 2013. Australia ICOMOS Incorporated.
- Chalana, M., & Krishna, A. (Eds.). (2020). Heritage Conservation in Postcolonial India: Approaches and Challenges.
- Cleere, H. (Ed.). (1984). Approaches to the archaeological heritage. Cambridge University Press.
- Glendinning, M. (2013). The conservation movement: a history of architectural preservation: antiquity to modernity. Routledge.
- Vit-Suzan, I. (2016). Architectural Heritage Revisited: A Holistic Engagement of its Tangible and Intangible Constituents. Routledge.

MACO123 - Knowledge Systems in Heritage Studies	Subject Category	TC
	Number of Credits	2
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	2

Objective:

- The objective is to explore the cultural knowledge systems of different societies and to use this traditional and architectural knowledge system for conservation.

Unit I Formal and Informal Knowledge System**6**

Difference between formal education and traditional knowledge. Prevailing knowledge within the society transferred through generations including those like prediction of rainfall, language, preserving and storage of food materials etc.

Unit II Intellectual Property and Traditional Knowledge**6**

Meaning and Scope of traditional Knowledge, Interface between IP and traditional Knowledge, Need and Significance of protection, International instruments on Traditional Knowledge, Recognition and Documentation of Traditional Knowledge, Databases.

Unit III Architectural Traditional knowledge**6**

Architectural Knowledge and its connection to Indigenous Architecture. Historic City, a product of people, place and time. Historicity and development. Architectural Knowledge System as a tool for Conservation

Unit IV Traditional Architecture and its associative crafts**6**

Traditional Architecture and its associative crafts. Knowledge System approach and its applicability in understanding various forms of architecture.

Unit V Intellectual Property**6**

Understanding various perception and interpretation of heritage. Origin and Development of IPR, Historical and theoretical basis for protection of IPR, Analysing and understanding the Interpretation of IP laws, Need for Protecting IP.

Total: 30 Periods**Outcomes**

Students finishing this course will be able to:

Apply the knowledge of various indigenous systems evolved over a period of time for conservation.

References:

- Emery, A. R. (2000). Integrating indigenous knowledge in project planning and implementation. International Labour Organization.
- Battiste, M. (1998). Enabling the autumn seed: Toward a decolonized approach to Aboriginal knowledge, language, and education. Canadian Journal of Native Education, 22(1).
- Johnston, D., & Linden, J. S. (2006). Connecting people to place: The power and relevance of origin stories. JS Linden. The Ipperwash Inquiry. Volume Two. www. law. utoronto. ca/documents/lectures/religion-johnston-0611. pdf.
- IPO, W. (2001). Intellectual Property and Traditional Knowledge, Booklet No. 2. New York: W IPO, 2007: 12, 18.
- Wijesuriya, G., Court, S. (2020). Traditional Knowledge Systems and the conservation and management of Asia's heritage, ICCROM-CHA Report.
- Norway, I. C. O. M. O. S. (2014, April). World Heritage and Rights-Based Approaches. In Report From Workshop In Oslo (pp. 1-3).

MACO124 – Research Methods & Report Writing in Heritage Studies	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- The course objective is to enable students to formulate appropriate research methodologies and theoretical frameworks relevant to pressing conservation issues in the Indian context.

Unit I Research Methodology**9**

What is research? Research versus faith, research versus project, philosophical and theoretical basis; Research philosophies – positivistic, phenomenological, anthropological; Research terminology; Types of Research – exploratory, descriptive, analytical, predictive; Research approaches – quantitative/ qualitative/mixed, basic/ applied, deductive/ inductive.

Unit II Research Methods**6**

Introduction to advanced research methods, structuring of complex research enquiries and development of hypotheses, required for good theoretical grounding and academic writing of a high standard.

Unit III Writing a Research Paper/Dissertation/ Inspection report**30**

Strategic evaluation of relevance of heritage research to wider societal, environmental and developmental issues. Identification of significant areas of research related to emerging heritage conservation issues. Developing contextual background; Research design; Identification of research problem; Research questions; Formulation of hypothesis; Writing aims, objectives, scope and limitations; Review of relevant literature; Identification of suitable research methods/ techniques/ instruments; Data collection – questionnaires, sampling techniques, observation, interviews; Analysis - qualitative and quantitative analysis, data synthesis; Research outcome – research findings, summarizing Scientific methods for heritage research in the inter-disciplinary and cross-disciplinary environments of heritage conservation and management. Linking primary and secondary data and establishing connections between theory, research and practice in both the Indian and International context.

Total: 45 Periods**Outcomes**

Individual and group guidance for writing a 3000-word research paper/ Dissertation/ Inspection report on identified research area. This research stage outcome could be published in the SPAV journal and other journals.

References:

- Punch, K. F. (2013). Introduction to social research: Quantitative and qualitative approaches. sage.
- Crotty, M. J. (1998). The foundations of social research: Meaning and perspective in the research process. The foundations of social research, 1-256.
- Daiute, C., & Lightfoot, C. (2003). Narrative Analysis: Studying the Development of Individuals in Society.
- Denzin, N. K. (2008). The landscape of qualitative research (Vol. 1). Sage.
- Groat, L. N., & Wang, D. (2013). Architectural research methods. John Wiley & Sons.
- Thomas, C. G. (2021). Research methodology and scientific writing. Thrissur: Springer.
- Waterton, E., & Watson, S. (Eds.). (2015). The Palgrave handbook of contemporary heritage research. Springer.

MACO125 - Conservation Methods and Materials – II; Conservation Lab	Subject Category	TC
	Number of Credits	4
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	4

Objective:

- The objective of the course is the application of the theoretical understanding of historic building materials and structural systems performance to variations in different regional contexts in India. As an extension of the subject taught in the 1st semester, It will focus on historic building technologies, structural behaviour of buildings, deterioration processes and conservation interventions.

Unit I Introduction to traditional and historic building materials 12

Introduction to traditional and historic building materials and construction vocabularies in different cultural regions of India. Cultural region for more elaboration can be studied in the context of the site taken up in the Conservation studio-II.

Unit II Spatial and functional assessment 12

Identification of materials and structural building system typologies, Inspection, condition assessment and diagnosis of material and structural defects, Spatial and functional assessment of historic buildings

Unit III Seismic Events 12

Identification of resilient systems in regions prone to earthquakes and extreme nature events

Unit IV Material & Structural Conservation 12

Rescue and conservation measures for distressed buildings, Methods of retrofitting, strengthening and upgradation for continued or reuse, Case studies of successes and failures in similar contexts.

Unit V Conservation Specifications 12

Preparation of conservation specifications, Laboratory testing of materials for material and structural analysis to support sensitive interventions.

Total: 60 Periods**Outcomes**

Students finishing this course will be able to:

Acquire knowledge of traditional materials and their behaviour and workability

References:

- Durbin, L. (2012). Architectural Tiles: conservation and restoration. Routledge.
- Kumar A. V. Indian National Trust for Art and Cultural Heritage & Indian Council of Conservation Institutes. (2001). Conservation of building stones (1st ed.). INTACH Indian Council of Conservation Institutes & Sundeep Prakashan.
- Cowper, A. D. (2017). Lime and lime mortars. Routledge.
- Forsyth, M. (Ed.). (2008). Materials & skills for historic building conservation. Blackwell Pub..
- Thomson, M. (2005). Properties of lime mortar. Structure Magazine, 26-29

MACO126 - Conservation of Cultural Landscapes, Historic Towns and Cities	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- This course examines that how environments reflect the values, beliefs, and ideas of a particular culture. Also, to address concerns for protection of the natural environment and techniques for sustainable development of cultural landscapes within multidisciplinary planning processes.

Unit I Concepts of Cultural Landscapes**6**

Eco philosophies and varying concepts of human relationship with nature in different cultural contexts, Methodology and parameters defining cultural landscapes and cultural regions.

Unit II Bio-geographical zones in India**9**

Basic ecological understanding of bio-geographical zones in India and their manifestations into cultural regions and cultural forms. (Mountain, Coastal, desert, riverine, highlands etc.) Definition of cultural landscapes as understood in the international framework (UNESCO, World Heritage sites, US Parks service etc.) Environmental and ecological planning, Environmental Impact Assessment, Govt. of India Policies for environment (forests, wildlife, hill, biosphere, wetlands, wastelands, oceans etc.), Eco sensitive zones, Climate change imperatives.

Unit III Cultural Landscapes Theory**12**

Understanding cultural landscape theories through examples (cultural geography, sacred landscapes, reading landscapes as texts, symbolism and meaning, local knowledge systems). Tools of analysis of natural landscapes and their interface with cultural contexts. Methods of defining, delineating and mapping cultural landscapes.

Unit IV Interdisciplinary approaches**9**

Interdisciplinary approaches to management of cultural regions and landscapes: International and national case studies. Demarcating Cultural Landscapes through various parameters like political, physical, natural, linguistic boundaries etc. Methods of mapping the Cultural Landscapes. Analysis of Cultural Landscapes. Management and Conservation of Cultural Landscapes /Regions.

Unit V Sustainable Development**9**

Strategies for sustainable development and conservation of cultural landscapes, integration into regional and district level developmental planning practices; Sustainable habitat programmes, Eco-sensitive zones.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Acquire knowledge about uniqueness of sacred landscapes and its importance in Indian context.

References:

- Agnoletti, M. (2006). The Conservation of Cultural Landscapes. CABI.
- Singh, P. (2010). Archaeology of the Ganga Plain: cultural-historical dimensions.
- Oliver, P. (2007). Built to meet needs: Cultural issues in vernacular architecture. Routledge.

- Singh, R. P. (2011). Heritagescapes and Cultural Landscapes: An Appraisal; in, Singh, Rana PB (ed.) Heritagescapes and Cultural Landscapes. Planet Earth & Cultural Understanding Series, Pub. 6.
- SINHA, A. (2020). Cultural Landscapes of India: Imagined, Enacted, and Reclaimed. University of Pittsburgh Press.
- Rubenstein, James M. (2002). The cultural landscape: an introduction to human geography. Upper Saddle River, NJ: Prentice Hall,

THIRD SEMESTER

MACO121 - Conservation Studio-III	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objective:

- The objective of the third semester studio is to introduce the students to a historic settlement/region; to understand the historic layering of the city/region and its values and meaning for the community; the role of urban systems and their inter-relational dynamics which give historic cities a distinctive and legible form; the agents and patterns of transformation. It provides an opportunity to apply the theories, principles and techniques of conservation introduced in the first two semesters.

Archival Research (Three weeks): Search and review of relevant literature and sources related to Historic town/settlement, region, period, style, and historicity.

***Site Visit and Documentation (Two weeks):** Detailed documentation of the identified historic settlement/city/region by studying the physical, socio-economic, environmental and governance aspects. Understanding its setting, significance and determinants that shaped the building.

Analysis (Five weeks): Analysis and Identification of the important issues with respect to material, construction, style, morphological aspects, transformations. Identifying various threats due to natural or man-made causes of defects/deteriorations and various degrees of its condition assessment at city and region level.

Conservation Proposals (Six weeks): Based upon identified issues the students have to give suitable conservation proposals for various aspects by applying theories, principles and techniques of conservation.

Deliverables shall include drawings and report. Progressive presentations shall be made for reviews at various stages.

Total: 225 Periods

Students finishing this course will be able to:

Study and find solutions to problem and issues confronting historic core/urban areas.

*The criteria for the selection of the site/settlements for the documentation is significant historic town/city, settlement, cultural region of phenomenon material culture. Distinct layers of heritage components shall be identifiable within identified site as a potential case for conservation. Accordingly, two weeks itinerary shall be prepared to explore hands on experience with the help of local resources/experts on various tools and techniques in documentation, investigations, assessment, and development of conservation strategies for the same.

MACO212 – New Paradigms in Conservation	Subject Category	TC
	Number of Credits	4
	Lecture Periods per Week	3
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	4

Objective:

- The objective of the course is to discuss the new paradigms, ideas and theories in conservation of heritage which take the subject beyond the realm of 'conventional' professional practice to areas such as community led sustainable conservation.

Unit I Theoretical Foundations**9**

Re-examination and expansion of the field's theoretical foundations, as well as the development of a new set of tools for their adequate protection. Sociology and anthropology as fields of enquiry to include cultural role of built form and social constructs of space: Understand heritage as integral to society and culture. Making Historical Preservation Sustainable.

Unit II Indigenous Heritage**12**

Heritage safety education in India. Assessment of local histories, values and implications on cultural studies; heritage as a continuum through time. Local and indigenous understanding of heritage to include the monumental and the vernacular built form, related crafts skills and crafts persons, practices, rituals, festivals etc.

Unit III Stakeholders in Heritage Conservation**15**

Stakeholders in heritage conservation: Identification of and role of stakeholders. Research methods on community studies: Community participatory resource assessment techniques; Cognitive mapping; Cultural mapping etc; Community perception and public participation in heritage conservation.

Unit IV Challenges of conservation of cultural heritage in India**12**

The challenge of conservation of cultural heritage in India. Whose heritage? Multiple meanings, Social access, territoriality, exclusion and inclusion of communities; Syncretism and contestations in heritage sites. Heritage areas and traffic control: Impact of rapid transport systems on heritage areas. Pedestrianization in historic areas. Traffic management in historic Cities/ Areas: at Regional and Local scale.

Unit V Assessments and Participatory Processes**12**

Participatory processes and frameworks; advocacy planning for conservation; concepts of social, cultural, environmental and economic sustainability. Impact assessments; Heritage Impact Assessment, Environmental Impact Assessment, Visual Impact Impact assessment, Cultural Heritage Impact Assessment. Revitalization Retrofitting and resilience, redevelopment; HRIDAY, Housing for all, Smart cities. Strategic Foundations for Integrated Heritage Management. Best Practices in Heritage Management.

Total: 60 Periods**Outcomes**

Students finishing this course will be:

Exposed to theories and practices of conservation beyond the conventionally understood realm.

References:

- Louw, M., & Papanicolaou, S. (2019). Buildings Reimagined: A Dialogue between Old and New. Images Publishing Group.
- Charter, I. C. O. M. O. S. (2003). Principles for the analysis, conservation and structural restoration of architectural heritage. Proceedings of the ICOMOS 14th General Assembly in Victoria Falls, Victoria Falls, Zimbabwe, 27-31.
- Szmelter, I. (2013, September). New values of cultural heritage and the need for a new paradigm regarding its care. In CeROArt. Conservation, exposition, Restauration d'Objets d'Art (No. HS). Association CeROArt asbl.
- Derde, W. (2020). On Paradigms, Theories, and Heritage. In R. Kren & M. Leisch-Kiesl (Ed.), Kultur - Erbe - Ethik: »Heritage« im Wandel gesellschaftlicher Orientierungen (pp. 37-48). Bielefeld: transcript Verlag
- Avrami, E. (2000). Values and heritage conservation. Conservation: The Getty Conservation Institute Newsletter, 15(2), 18-21.
- Otero, J. (2022). Heritage conservation future: where we stand, challenges ahead, and a paradigm shift. Global Challenges, 6(1), 2100084.
- Orbaşlı, A. (2017). Conservation theory in the twenty-first century: slow evolution or a paradigm shift. Journal of Architectural Conservation, 23(3), 157-170.
- Turcanu-Carutiu, D. (Ed.). (2022). Heritage: New Paradigm. BoD–Books on Demand.

MACO213 – Heritage and Jurisprudence	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	3
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- The objective of the course is to understand the various aspects of law and jurisprudence needed to strengthen the discipline of heritage conservation.

Unit I Heritage Legislation in the International Context**6**

The role of law and its importance for society. Principles and approaches to heritage legislation in the international context e.g. Malraux Act, Civic amenities Act, World Heritage Sites regulatory frameworks and case studies.

Unit II Legislation**9**

Overview of evolving heritage management systems and linked legislation in India; ASI: Conservation Policy

Unit III Acts**12**

Detailed assessment of the Indian legal framework in the context of protected and unprotected buildings and historic settlements: AMASRA, Model Heritage Act, Planning legislation, Municipal Acts, Environment Act, Rent Control Act, Slum Act, Land Acquisition Act etc. Housing scenario and impact on historic housing stock. Policies, finance and Legislation, Historic and vernacular housing in India, Slum act, Slum policies, Rent Control act, and existing incentives: implications on the historic housing stock.

Unit IV Planning Incentives for Conservation**9**

AMASR Amendment 2010, 2017 and implications for urban conservation. Regulatory mechanisms and planning incentives for conservation.

Unit V Public Interest Litigation for Heritage Assets**9**

Public Interest Litigation for Heritage assets: Case studies. Legislation pertaining to adaptive reuse: International case studies.

*Pedagogic methods and assessment: As a lecture course, it will be linked with the studio exercise on Historic settlement conservation.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Learn various aspects of law and jurisprudence, Indian legal framework to strengthen the discipline of heritage conservation.

References:

- ASI, Report. (2014, February), National Policy for Conservation of the Ancient Monuments, Archaeological Sites and Remains, Govt. of India, New Delhi.
- Standard, I. (1893). Criteria for earthquake resistant design of structures. Bureau of Indian Standards, Part, 1.
- Marshall, J. H. (1923). Conservation manual: A handbook for the use of archaeological officers and others entrusted with the care of ancient monuments. Superintendent government printing, India.
- Lixinski, L. (2019). International heritage law for communities: exclusion and re-imagination. Oxford University Press.
- Lixinski, L. (2019). International heritage law for communities: exclusion and re-imagination. Oxford University Press.
- Kawathekar, V. (2020). Legal frameworks for the protection of built heritage in India. Ghaziabad.

MACO214 – Conservation Economics and Finance	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- This course discusses the conceptual framework of the critical area of the economics of heritage, and its centrality for heritage resource management and sustainable development.

Unit I Economic sustainability for heritage conservation**6**

Economic sustainability for heritage conservation: Basic economic concepts related to heritage, creating bridges between heritage and economics, economic mechanisms for the implementation of heritage conservation from policies to projects.

Unit II Concepts of Cultural Capital**12**

Concepts of Cultural Capital: Core issues and techniques that determine value embodied in or generated by heritage resources; Types of values of heritage, Measurement and quantification of costs and benefits of heritage conservation in economic terms. Understanding and analysis of Schedule of rates by various agencies for architectural conservation, Costing and estimation-preparation of BOQ's for conservation projects.

Unit III Non-market evaluation techniques**9**

Non-market evaluation techniques for Heritage resources – Travel Cost, Contingent Valuation, Hedonic Pricing, Combined Methods, Choice Modelling.

Unit IV Funding heritage conservation**6**

Problems and issues of funding heritage conservation, and Existing programmes for financing. Assessment of economic viability of conservation projects: National & International case studies.

Unit V Project on valuation of heritage resources**12**

Project on valuation of heritage resources – Case studies of innovative conservation financing mechanisms and programmes.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Address the complex realities, management issues and dynamic nature of Indian historic towns and cities.

References:

- Rizzo, I., & Mignosa, A. (Eds.). (2013). Handbook on the economics of cultural heritage. Edward Elgar Publishing.
- Standard, I. (1893). Criteria for earthquake resistant design of structures. Bureau of Indian Standards, Part, 1.
- Marshall, J. H. (1923). Conservation manual: A handbook for the use of archaeological officers and others entrusted with the care of ancient monuments. Superintendent government printing, India.
- Binda, L., Gambarotta, L., Lagomarsino, S., & Modena, C. (2018). A multilevel approach to the damage assessment and the seismic improvement of masonry buildings in Italy. In Seismic damage to masonry buildings (pp. 179-194). Routledge.
- Pacelli, V., & Sica, E. (2020). The economics and finance of cultural heritage: how to make tourist attractions a regional economic resource. Routledge.

MACO2110 – Elective I: Heritage Impact Assessment	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

- To enable students' exposure to a contemporary study area of their choice, over and above the remaining structured subjects of the programme of study.

This course will offer guidance on the process of commissioning Heritage Impact Assessments (HIAs) for Heritage properties in order to evaluate effectively the impact of potential development on the different values of properties. The guidance is addressed at managers, developers, consultants and decision-makers and is also intended to be relevant to the World Heritage Committee and States Parties.

Total: 45 Periods**References:**

- Jo, E., Mackay, R., Murai, M., & Therivel, R. (2023). Guidance and toolkit for impact assessments in a world heritage context (Ara).
- Cepaitiene, R., Bers, V. M., Szmelter, I., Navickiene, V., (2015). How to assess built heritage? Assumptions, Methodologies, Examples of Heritage Assessment Systems, Florence-Lubin.UNESCO
- UNESCO. Legal Affairs, recommendation concerning the Protection, at National Level, of the Cultural and Natural Heritage.
- Ridge, M. M. (Ed.). (2014). Crowdsourcing our cultural heritage. Ashgate Publishing, Ltd.
- UNESCO. (2012). "World Heritage Committee Places Liverpool on List of World Heritage in Danger.". <http://whc.unesco.org/en/news/890/>
- ICOMOS. (2020). Heritage Impact Assessment (HIA) Guidebook for Bangladesh

MACO2111 – Elective II : Disaster Management of Cultural Resources	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

- To enable students' exposure to a contemporary study area of their choice, over and above the remaining structured subjects of the programme of study.

The course explores the different interlinked components: disaster risk management, cultural heritage management and urban planning and development. At one end of the spectrum, it addresses the general principles of disaster risk management for cultural heritage, while at the other it attempts to provide focused learning for participants to deal with various challenges related to disaster risk management of cultural heritage within their local context.

Total: 45 Periods**References:**

- Binda, L., Gambarotta, L., Lagomarsino, S., & Modena, C. (2018). A multilevel approach to the damage assessment and the seismic improvement of masonry buildings in Italy. In *Seismic damage to masonry buildings* (pp. 179-194). Routledge.
- Jigyasu, R., & Chmutina, K. (Eds.). (2023). *Routledge Handbook on Cultural Heritage and Disaster Risk Management* (1st ed.). Routledge.
- Jigyasu, R., Kim, D., & Shakya, L. (Eds.). (2023). *Good Practices for Disaster Risk Management of Cultural Heritage: Practices of ITC Participants* (1st ed.). Routledge.
- Shaw, R., Sharma, A., & Takeuchi, Y. (2009). *Indigenous knowledge and disaster risk reduction: From practice to policy*. Nova Science Publishers, Inc.
- Binda, L., Gambarotta, L., Lagomarsino, S., & Modena, C. (2018). A multilevel approach to the damage assessment and the seismic improvement of masonry buildings in Italy. In *Seismic damage to masonry buildings* (pp. 179-194). Routledge.

MACO2112 – Elective III: Decolonising Museums and Heritage	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	2

Objective:

- To enable students' exposure to a contemporary study area of their choice, over and above the remaining structured subjects of the programme of study.
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The course explores involves theoretical teaching of history, general principles of organization, presentation, administration, management, operations and advancement of museums and collections. Museum archaeologists reconstruct the history of humanity, from its origins to today, based on surviving vestiges. The field of Museology will focus on collections conserved in museums, libraries, and archives; protected buildings; rare professional knowledge; cinema; and photography. Museums in the Indian context; contextualizing the dissemination of information; Research and education.

Total: 45 Periods

References:

- UNESCO. Activities, World Heritage Convention, World Heritage sites and Museums: A pact for sustainable development.
- Routledge Series in Conservation and Museology, Book Series, Routledge & CRC Press
- Bhattacharya, I. Restoring Indian Culture & Heritage through Museology and Conservation.

MACO217 – Summer Internship	Subject Category	TC
	Number of Credits	2
	Lecture Periods per Week	-
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	-

Objective:

- The objective of the 6-8 weeks summer internship is to inculcate hands on exposure to different phases and aspects of conservation practice in India, including client interaction, as well as fieldwork and coordinated on-site implementation of conservation works with skilled master-masons and craftspeople.

Summer Internship has to be done under the supervision of a qualified Conservation architect, organisation or Conservation professional, involving hands-on experience of various stages of an ongoing conservation project for a minimum period of 6 Weeks. Each student is to document all work responsibility, and prepare a *Summer Internship Report that includes representative examples of work undertaken: preparatory documentation, condition assessment; development of practical, scientific conservation interventions. Students are encouraged to work on site, and familiarize themselves with specialized structural consolidation, stabilization and restoration techniques as part of the Summer Internship.

*The students have to submit an internship report of the work done and internship certificate from the employer. They need to make a presentation of the work done during internship period, which will be reviewed and assessed by the internal assessment committee in third semester.

FOURTH SEMESTER

MACO221 – Conservation Thesis	Subject Category	TC
	Number of Credits	24
	Lecture Periods per Week	6
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	18
	Total Periods per Week	24

Objective:

- The aim of thesis is to culminate the academic learning in the conservation programme. Thesis study and topic should focus on conservation of heritage areas which are important in architectural merit, historic interests and cultural values. It should be structured to conserve these heritage areas, save them from ravage and encroachment and destruction.

Thesis shall bring together an understanding of the discipline of conservation acquired over the previous three semesters. The students are encouraged to select any project of their choice which offers an opportunity to synthesize the theoretical, technical and management aspects of conservation, through primary and secondary data collection, compilation, analysis and proposals. The thesis is an opportunity for students to make an original contribution that expands knowledge of conservation in India. The thesis studio is supported by and linked to the other subjects being conducted simultaneously in the semester. The Thesis should address the heritage areas by classifying heritage resources, listing, grading, assessing reviewing legal laws, significance assessment, reviewing legal laws for evaluating heritage monuments/sites/towns/region and proposing policies for planning and conserving heritage areas at Building/Area/City level.

Deliverables shall include drawings and Thesis report. Progressive presentations shall be made for reviews at various stages.

Site Visits and Documentation Period: (Spread over Four-weeks depending upon various stages of thesis topic and its requirement).

MACO222 – Heritage Management Seminar	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objective:

- The objective of this seminar is to strengthen the management aspect of the selected conservation thesis project.

Seminar Framework:

Each student will be identifying emerging areas of heritage management, related to their thesis topic, based on the issues dealt with in the earlier semesters. These aspects could include Risk preparedness for heritage, Cultural resource information management systems, Economic feasibility assessment, Participatory heritage resource management, Conservation site management, Formulation of conservation & development guidelines & bye-laws for heritage areas, among others. Students will undertake a comparative analysis of the management framework in the context of the selected thesis with relevant international and national examples, and present their work in the form of a seminar. Lectures on selected topics will be given to supplement guided research.

Outcomes

Individual and group guidance for writing a 5000-word paper on initial exploration of identified research area to supplement Thesis project. This research stage outcome could be published in the SPAV journal and other journals.

References:

- Holtorf, C. (2018). Preservation paradigm in heritage management.
- UNESCO Office Bangkok and Regional Bureau for Education in Asia and the Pacific (2021)., Competence framework for cultural heritage management: a guide to the essential skills and knowledge for heritage practitioners, Paris, France.
- King, T. F. (2011). A companion to cultural resource management. A John Wiley & Sons, Ltd., Publication.
- Vileikis, O. (2019). Creating information management systems for cultural World Heritage: Experiences from Central Asia. In The Routledge Handbook on Historic Urban Landscapes in the Asia-Pacific (pp. 181-198). Routledge.
- Feilden, B. M., & Jokilehto, J. (1998). Management guidelines for world cultural heritage sites. (No Title).

MACO223 – Interventions at Historic Buildings	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

- This course equips students with specialized knowledge and skills necessary for designing and implementing interventions in historic buildings.

Unit I Conservation Standards and Guidelines**6**

International and national standards and guidelines for the conservation of historic buildings, focusing on their application in the Indian context. Students will analyze how these guidelines influence conservation practices and policy-making.

Unit II Structural Interventions and Strengthening Techniques**12**

Structural assessment methods and the latest techniques for repairing and strengthening historic buildings. Challenges and solutions specific to Indian heritage structures, including seismic retrofitting and materials conservation methods adopted in different region.

Unit III Adaptive Reuse**9**

Principles and practices of adapting historic buildings for new uses while ensuring their functional upkeep. Students will study successful case studies of adaptive reuse in India and develop their own design proposals for similar projects.

Unit IV Conservation Practices**12**

Practical and professional aspects of conservation, including traditional materials and methods used in conservation of heritage buildings. Hands-on techniques and the integration of modern conservation science with traditional practices.

Unit V Monitoring and Maintenance of Historic Buildings**6**

This unit covers the ongoing monitoring and maintenance necessary for the long-term conservation of historic buildings. Students will explore preventive conservation techniques, maintenance planning, and the use of modern technology in monitoring heritage structures.

Total: 45 Periods**Outcomes**

Students finishing this course will be able to:

Expertise in designing conservation-oriented interventions for historic Indian buildings.

References:

- D'Agostino, Salvatore (2021) Conservation and Restoration of Built Heritage: A History of Conservation Culture and its More Recent Developments
- Ioannis N. P, Stavroula J. P, Manolis P (2015) Seismic Assessment, Behavior and Retrofit of Heritage Buildings and Monuments.
- Cantacuzino, S. (1975). New Uses for Old Buildings. London.
- Charles, F.W.B. (1995). Conservation of Timber Buildings. Shaftesbury: Donhead.
- Croci, G. (1998). The Conservation and Structural Restoration of Architectural Heritage. Southampton: Computational Mechanics Publications.
- Krier, L. (1998). Architecture, Choice or Fate. London: Papadakis Publisher.
- Larkham, P.J. (1996). Conservation and the City. London: Routledge.
- Roberts, P. & Sykes, H. (1999). Urban Regeneration. Sage Publications.
- Watt, D. & Swallow, P. (1996). Surveying Historic Buildings. Shaftesbury: Donhead.

Master of Architecture (Landscape Architecture)

Course Structure and Detailed Syllabus for
Two-Year Masters Degree Programme in Architecture

Effective from the Academic Year 2024-25 onwards
(As Approved by Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाडा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA.

Course Structure

FIRST SEMESTER							
SR. NO.	SUBJECT CODE	SUBJECT TITLE	DISTRIBUTION OF PERIODS PER WEEK				CREDITS
			L	T	S	TP	
1	MLAR111	Landscape Architecture Studio - I	-	-	12	12	12
2	MLAR112	Plants Systematic, Plant Processes, Field Study & Edaphic parameters.	2	-	3	5	5
3	MLAR113	Landscape Graphics & Visual Communication	1	-	2	3	3
4	MLAR114	Geology, Hydrology & Geomorphology	2	1	-	3	3
5	MLAR115	Site Planning and Landscape Engineering - I	2	-	2	4	4
6	MLAR116	Theory of Landscape Architecture - I	2	1	-	3	3
TOTAL			10	1	19	30	30

SECOND SEMESTER							
SR. NO.	SUBJECT CODE	SUBJECT TITLE	DISTRIBUTION OF PERIODS PER WEEK				CREDITS
			L	T	S	TP	
1	MLAR121	Landscape Architecture Studio - II	-	-	12	12	12
2	MLAR122	Ecology, Ecosystem Analysis and Field Ecology	3	-	-	3	3
3	MLAR123	Theory of Landscape Architecture- II	2	1	-	3	3
4	MLAR124	Plants and Design	2	-	3	5	5
5	MLAR125	Site Planning and Landscape Engineering - II	2	-	2	4	4
6	MLAR126	Geoinformatics for Landscape Architecture	1	-	2	3	3
TOTAL			10	1	19	30	30

THIRD SEMESTER							
SR. NO.	SUBJECT CODE	SUBJECT TITLE	DISTRIBUTION OF PERIODS PER WEEK				CREDITS
			L	T	S	TP	
1	MLAR211	Landscape Architecture Studio-III	-	-	12	12	12
2	MLAR212	Landscape Economics, Landscape Management, Project Management, and Professional Practice	2	1	-	3	3
3	MLAR213	Sustainable and Energy Efficient Landscape	2	1	-	3	3
4	MLAR214	Landscape Resources and Conservation	3	1	-	4	4
5	MLAR215	Research Methodology	2	-	3	5	5
6	MLAR216	Summer Training	-	-	-	-	3
TOTAL			10	2	15	27	30

Note: Summer Training undertaken for a period of 6 weeks at the end of Second Semester is evaluated as part of Third Semester.

FOURTH SEMESTER							
SR. NO.	SUBJECT CODE	SUBJECT TITLE	DISTRIBUTION OF PERIODS PER WEEK				CREDITS
			L	T	S	TP	
1	MLAR221	Thesis	-	-	24	24	24
2		Elective I	2	1	-	3	3
	MLAR222	Future Cities					
	MLAR223	Interior Landscape					
	MLAR224	Movement Corridor					
	MLAR225	Green Infrastructure					
3		Elective II / Open Elective	3	-	-	3	3
	MSAR2210	Energy Audit and EIA					
	MBEM1211	Waste Management					
	MSAR1210	Eco Cities					
		Course from SWAYAM / Online Course (as PBOC)	-	-	-	-	-
TOTAL			6	0	24	30	30

TC Theory Course
JC Jury Course

L Lecture
S Studio

TP Total Periods

Detailed Syllabus for Master of Architecture (Landscape Architecture)

FIRST SEMESTER

MLAR111-Landscape Architecture Studio I	Subject Category	JC
	Number of Credits	12
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	12

Objectives:

- To give an introduction to landscape design.
- To give introductory exercises in art, architecture and landscape.
- To give knowledge about landscape analysis and site planning for medium sized sites.

Students are expected to incorporate the learning from other subjects of the present semester to add value to the Studio outcome. Various materials, which can be used on Site for different components of the built form, may be explored through Site visits and observatory studies.

Studio project in Landscape Analysis, Landscape Design and Site Planning of small residential, recreational or civic spaces at community level for medium sized sites of area upto 2 Hectare in the identified context.

Design may be a cumulative result of basic landscape design issues and elements. Simple site planning, use of hard and soft landscape materials for defining and structuring the open spaces. Landscape design in relation to architecture.

Professional Communication: Readings in Landscape Architecture. Introductory exercises in Art, Architecture & Landscape. Urban and Rural Landscape appraisal.

Total Period 180

Outcome :

Students finishing this course will be able to:

- Collaborate the various ideas of space planning through different design interventions at the micro level

References:

1. C.H.T. (n.d) Landform Designs , P D A Publication.
2. H, P.P. (n.d) Concrete Floors Finishes .
3. Michael, L. (1988) Tree Detailing, London: Butterworth Architecture.
4. Michael, L. (n.d) Landscape Detailing Vol.1 Enclosure.
5. Stevens, D. (n.d) Ultimate Water Garden Book.
6. Swaffield Simon, 'Theory in Landscape Architecture', University of Pennsylvania Press, Philadelphia, 2002.
7. Charles. W.Harris& Nicholas T. Dines, 'Time Saver Standards for Landscape Architecture' -2nd Edition, Mc. Graw Hill, 1998.
8. Nick Robinson, 'The Planting Design Handbook' -3rd Edition, Gower Pub, Routledge, 2016.
9. Strom Steven, 'Site Engineering for Landscape Architects' -6th Edition, John Wiley and sons Inc, 2013

MLAR112 - Plants Systematic, Plant Processes, Field Study & Edaphic parameters.	Subject Category	TC + S
	Number of Credits	5
	Lecture Periods per Week	2
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	3
	Total Periods per Week	5

Objectives:

- To develop an understanding of the plant material in Landscape Design.
- Examine the characteristics of Plants with reference to the plant material in design.
- Field trips with experts are required to identify the specific characteristics of the plants.
- Students are required to prepare a herbarium.

Unit I Plant Classification and Identification**15**

Fundamentals of plants, identification of physiological characteristics, deciduous and evergreen. Classification of Plant Kingdom. Taxonomy. Principles of nomenclature and identification.

Unit II Plant Anatomy**15**

General study of plant anatomy to understand the plant functions. Structure of plant cells, tissues and organs in relation to plant functions.

Unit III Plant Morphology**15**

Growth habits, habitat, origin, growth duration, leaf arrangement, leaf type, main flower colour, flowering period, family, genus. Structural characteristics of plants, trees, shrubs, and ground covers. Plant formations in Eco zones. Interdependence of animals and plants.

Unit IV Soil Classification and Properties**15**

Genesis, morphology, and classification of soils. Properties of Soils: Physical, Chemical, Biological and Mineralogical.

Unit V Relationship Between Plants and Soil**15**

Relationship between geology, soils and vegetation to be explored through practical examples with the help of field study / field visits.

Field visit(s) required to identify the characteristics of various flora, by visiting a greenhouse / nursery / seedbed.

Plant & Ecology Laboratory: Understanding plant identification and costing; plant material and their groupings, techniques and methods of plant propagation. This lab shall be in the form of a greenhouse and a nursery.

Total Period**75****Outcome :**

Students finishing this course will be able to:

- Understanding of Binomial nomenclature of plants.
- Appreciate and analyse the plant morphology and growth habits.
- Understand the fundamental aspect of plant identification.

References:

1. Ambasht, R.S. and Ambasht, N.K. (2002) Modern Trends in Applied Terrestrial Ecology, 1st edition, US: Springer US.
2. Austin, R. (2001) Elements of Planting Design, 1st edition, New York: John Wiley & Sons.
3. Randhwa, M.S. (1957) Flowering Trees, New Delhi: Indian Council Of Agricultural Research.
4. H, S. (1966) Common Trees –India, The Land and the People, New Delhi: National Book Trust.
5. Keith, R. (1974) Man, nature and ecology, Aldus book limited.
6. Kluwer academic publishers (2018) Landscape Ecology, 3rd edition, Netherlands: Springer Netherlands.
7. Kormondy, E.J. (1969) Concepts of Ecology, 4th edition, Prentice Hall.
8. Bose, T.K., Chowdhury, B. and Sharma, S.P. (2011) Tropical Garden Plants in Colour, New Delhi: Horticulture And Allied Publishers.
9. M., L.a.G.H. (1964) Taxonomy of Vascular Plants, New York: Oxford.

MLAR-113 Landscape Graphics and Visual Communication	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	3

Objectives:

- To expose the students about the various techniques of presenting landscape design drawings.
- To train the students in preparing design portfolios

Unit I Graphic Language and Design Process

9

Drawings used for design communication – Concept, Scheme, Drawing and free hand Sketches. Use of pen, pencil and other manual media.

Unit II Representation of Landscape Elements and Maps

9

Develop understanding of the basic landscape elements & principles; Visual compositions. Introduction to represent different textures and finishes in plan and elevation. Developing Site analysis maps, conceptual diagrams and illustrations. Sheet formatting and compositions.

Unit III Use of Digital Tools for Rendering

9

Application of software for drafting, visualization, rendering, presentation, report making, video or walkthrough creation and editing etc. Application of AI tools and ethical use of AI tools for design illustration.

Unit IV Documentation of Regional landscape

9

Documentation of different landscapes characters, visual qualities, activity, vegetation and infrastructure mapping in regional scale.

Unit V Advanced Visual Techniques

9

3D rendering and animation, mixed media methods of presentation.

Total Period

45

Outcome :

- Knowledge and skill about preparing landscape design portfolios.

References:

1. Reid, G. W. (1987). *Landscape Graphics*. Design.
2. Bishop, I. and Lange, E. (2005). *Visualization in Landscape and Environmental Planning*, Taylor and Francis.
3. Bertauski, T. (2006). *Plan Graphics for the Landscape Designer; with Section, Elevation and computer Graphics*, Pearson Prentice Hall.
4. Wang, T.C. (1996). *Plan and Section Drawing*, John Wiley and sons.
5. Ervin, S.M. and Hasbrouck, H.H. (2001). *Landscape Modeling: Digital Techniques for Landscape Visualization*, McGraw-Hill Professional.
6. Edward Hutchison(2019) *Drawing for Landscape Architecture: Sketch to Screen to Site*
7. Bradley Cantrell and Wes Michaels(2014) *Digital Drawing for Landscape Architecture: Contemporary Techniques and Tools for Digital Representation in Site Design*

	Subject Category	TC
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MLAR114-Geology , Hydrology and Geomorphology	Number of Credits	3
	Lecture Periods per Week	3
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To develop an understanding of the geological pattern of the region and devise an approach to use the parameters in landscape design.
- To develop an understanding of the drainage pattern, watershed and usefulness of the hydrological principles in evolving a landscape design.

Unit I Introduction to Geology

9

Earth in space: Origin and interior structure of the earth. Early history of Earth: Origin of life and meaning of fossils as keys to the past. Life through the geologic ages, Deccan Basalt volcanism, Plate tectonics, Natural hazards: Causes and effects viz. Volcano, tsunamis Earthquakes: seismic micro-zonation, seismic zones of India. Minerals and Metals.

Unit II Geological Patterns

9

Rocks: Igneous, Sedimentary and Metamorphic rocks, Isostasy, plate tectonics, crustal deformation and mountain building. Structural geology: dip, strike, folds, faults, joints, unconformities. Stratigraphy: principles, geologic time scale and geology of India. Glaciers of India, geothermal fields of India. Geologic maps, Application of geological information in the interpretation of landscapes on maps and in the field. Case studies-Application of geologic principles to environmental problems e.g.: Stream restoration, hydrogeology, geotourism.

Unit III Hydrological Cycle;

9

Evaporation, evapo-transpiration; and sources of surface water, forms of subsurface water, Occurrence and movement of groundwater, geologic formations as aquifers, Infiltration, Soil moisture. Precipitation, weather system's for precipitation, Rainfall regime with specific reference to the Indian region. Characteristics and management of drainage basins: Introduction to watersheds; Types of Flow: Channel and over-land.

Unit IV Hydrological Process

9

Surface water flow, Runoff: hydrograph, runoff characteristics of streams, field, flow duration curve, Flow mass curve. Characteristics of Precipitation in India; relationship to vegetation, drainage basins, natural drainage patterns. Artesian conditions, development of Karst topography; saltwater intrusions. Aquifer recharge area, infiltration characteristics; Water efficient landscape designs, rainwater harvesting, artificial recharge, Groundwater management, sources of groundwater pollution and its control Flood plains.

Unit V Geomorphology

9

Major processes and associated landforms. Tectonic, Fluvial, Aeolian, Coastal, Karst, Glacial, and topography caused by groundwater, deformations in landform Climatic geomorphology and morphogenic regions: Structural geomorphology, landforms developed on sedimentary sequences, volcanoes and volcanic landforms, pseudo structural landforms. Running water and underground water: Channel networks and drainage basins, Hill slope geomorphology. Landforms related to the activities of

organisms and man. Application of remote sensing in geomorphology. Geomorphological features of the Indian subcontinent.

Total Period 45

Outcome :

Students finishing this course will be able to:

- Understand the basics of various geological factors used for reding the landscapes.
- Appraise the connection between factors as geology, vegetation etc for impending landscape design pertaining to environmental problems.
- Analyzing various patterns of surface and subsurface groundwater movement.
- Understand the various processes of landform formation, causes and effects.

References:

1. Akhauri, S. (2015) Fundamentals of Hydrogeology, Zorba Books.
2. Babar, M.D. (2005) Hydro geomorphology: Fundamentals, Applications and Techniques, New India Publishing Agency.
3. Davie, T. (2017) Fundamentals of Hydrology, T&F/Routledge.
4. Dine, C.W.H.A.N.T. (1997) Time Saver Standards for Landscape Architecture, , 2nd edition, McGraw-Hill Education.
5. Dullo, W.-C. (2018) 'Environmental Geology', International journal of earth science, no. 531.
6. etal., J.A.Z. (2016) Geopedology: An Integration of Geomorphology and Pedology for Soil and Landscape Studies, Springer.
7. Gohau, G. (1990) A History of Geology, revised edition, Rutgers University Press.
8. Goudie, A. (2010) Landscapes and Geomorphology: A very short, OUP Oxford.
9. Huggett, R.J. (2016) Fundamentals of Geomorphology, Taylor and Francis.
10. ISSS (2015) Soil Science: An Introduction, Indian Society of Soil Science (ISSS).
11. M.A.Glazovskaya (1984) Soils of the World: Soil Families and Soil Types, Amerind Publishing Co.Pvt.Ltd.
12. Mahapatra, G.B. (2008) Textbook of Physical Geology, CBS.
13. Oldroyd, D. (1996) Thinking about the Earth: A History of Ideas in Geology , First Edition edition edition, Harvard University Press;.
14. Robinson, H. (1969) Morphology and Landscape , 1st edition, University Tutorial Press.
15. Tilley, C. (2010) Interpreting Landscapes: Geologies, Topographics, Identities, 1st edition, Routledge.
16. Walker, J.D. (2009) The Geoscience Handbook , Fourth Edition edition, AGI Data Sheets
17. Viessman ,Warren(1985), Water Management-Technology and Institutions, Harper & Row,
18. Bansil, P.C,(2004), Water Management in India, Concept Publishing

MLAR115 -Site Planning and Landscape Engineering I	Subject Category	TC +S
	Number of Credits	4
	Lecture Periods per Week	2
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	4

Objectives:

- To develop a complete understanding of a site and the surroundings, with a whole-to-part approach on a holistic basis. Students must examine the natural, cultural, and social systems that affect the design decisions, as well as the language and literature of landscape architecture.
- Studies to be undertaken on land development planning to appraise students in environmental, economic, legal, and visual issues associated with land planning process

Unit I Site Mapping

9

Site Survey and mapping: topographic surveys and their methodology, visualizing landforms. Understanding contours and their characteristics, graphical representation, deriving contours by interpolation. Earth form Grading: Symbols and annotations, basic grading principles, grading terraces, grading of roads across/along contours, Basics of road alignment (horizontal and vertical)

Unit II Site Analysis

9

Processes and practices of site planning and development, including site inventory, analysis and assessment of potential building sites. Site planning process and its significance: Establishing relationship between site characteristics and design requirements. Inventory, documentation and site planning checklist.

Unit III Shaping the Landforms

9

Landform modulation: Structured and landscape elements. Surface Drainage: Site planning for efficient drainage; understanding drainage pattern and watershed area, calculation of surface runoff, determination of catchments area and discharge rate; types of drainage systems, design of drainage elements: swales and culverts etc. Planning, grading and drainage of sports fields. Earthwork- cut and fill processes, volume computation

Unit IV Site Services and Landscape Infrastructure

9

Landscape simulation and site utilities: Basic planning and understanding of principles for external lighting, types of fixtures and their use in varying situations. Irrigation: Broad systems and their utility as per plantation typology. Street furniture / site furnishings. Overall consideration of external electrical, plumbing co-ordination vis-à-vis routing and interface with landscape elements.

Unit V Landscape Technology -Basic

9

Landscape Construction: Factors in relation to systems, structures and materials for: Circulation: Roads and Parking, paths and plazas. Level Change: Wall, steps and ramps Planting: Planters, beds, edges and terraces. Water elements: Pools and water bodies. Working drawings: Format and logical representation of information.

Outcome :

Students finishing this course will be able to:

- Explore the techniques of Site analysis, landscape drawing and site elements.
- Understand the grading & design as closely related & dependent processes.
- Understand the site drainage and creation of drainage plan.

References:

1. Dines, C.W.H.N.T. (2001) Time saver Standards for Landscape Architecture, Mc. Graw Hill.
2. Lynch, K and Hack, G (1984) Site Planning , MIT PRESS.
3. Hamid, S. (1985) Urban Design Process , Van Nostrand Reinhold.
4. Hopper (2007) Landscape Architectural Graphic Standards Student Ed., John Wiley and Sons Inc.
5. Ingels, J.E. (1992) Landscaping – Principles & Practices , Pelmer Publishers Inc.
6. Lovejoy, D. (1973) Land use and Landscape Planning, Barnes & Noble.
7. Lynch, K. (1994) A Good City Form , MIT PRESS.
8. Mukoda, N. (1990) Street furniture, Bijutsushuppan – sha Ltd.
9. Niall, K.a. (1999) The Art of Landscape Detail: Fundamentals, Practices and Case Studies.
10. Reid, G.W. (1987) Landscape Graphics, Watson , New York: Guptill publication.
11. Russ, T.H. (2002) Site Planning and Design Handbook, Mc Graw-Hill Companies.
12. Ryan (2011) Detailing for Landscape Architects, John Wiley and Sons Inc.
13. Sauter, D. (2000) Landscape Construction, Pelmer Thomson Learning.
14. Simonds, J.O. (1990) Landscape architecture- A manual of site planning and design , Willey.
15. Steven, S. (2004) Site engineering for landscape Architects, John wiley and sons Inc.
16. Tom, T. (1995) City As Landscape, Taylor and Francis.
17. Wood, M.L. (1993) Landscape Detailing Volume I -IV, Architectural Press.

MLAR116 Theory of Landscape Architecture I	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To equip the students with the knowledge base regarding history of landscape Architecture with the various theories that have guided landscape design through the ages.

Unit I Traces of landscape planning and design from Ancient Heritage 9

Process of transforming landscapes; landscapes of Power, Faith and Place from Mesopotamia, Egypt, Greece, Rome

Unit II Traces of landscape planning and design from Western Civilization and Middle-east 9

Process of transforming landscapes in Europe; Italy, France, and England ,Persian tradition and its influence

Unit III Traces of landscape planning and design from Eastern Civilisation 9

Process of landscapes in China , Japan ,Ancient and medieval period in India; Mughal and Rajput Landscapes. Development of landscape design and gardens till the early 19th century

Unit IV An introduction to various dimensions in landscape 9

Understanding of Landscape as a “Language”. Various process of Narrations to “Communicate” and Express” the Landscape by various Architects .Study of works of renowned Landscape Architects, their philosophies.

Unit V Cultural landscapes 9

Identity, collective memory; landscape as text, Landscape as an Art. Theoretical terrain of landscape architecture: nature of theory in landscape architecture, design process, form, meaning and experience. Society, language, representation of landscape.

Total Period 45**Outcome :**

Students finishing this course will be able to:

- Understand the process of landscape planning throughout history.
- Apply the concepts of historical impression in landscape planning by integrating cultural, social and environmental factors etc

References:

- Geoffrey and Susan Jellicoe, The landscape of Man, Thames & Hudson Publication, 1995
- Robert Holden, New landscape Design, Lawrence king publishing, UK, 2003
- Penelope Hill, Contemporary history of garden design, Birkhauser publishers, 2004

4. Elizabeth Barlow Rogers, Landscape Design – A Cultural & Architectural History, Harry & Abram inc. publishers, 2001.
5. Phillip Pregill & Nancy Volkman, Landscapes in History, Van Nostrand publishers, 1993.
6. Jonas Lehrman, Earthly Paradise- Garden and courtyard in Islam, Thames and Hudson, 1980.
7. G.B. Tobey, A history of American Landscape architecture, American Elsevier Publishing Co., NY, 1973.
8. Pieluigi Nicholin, Francesco Repishti, Dictionary of today's landscape designers, Skira Editores P.A, 2003.
9. Schaal, Hans Dieter (1993), New Landscape Architecture, Ernst and Sohn
10. Dee, C. (2001) Form and Fabric: A Visual Introduction, London: Spon Press- Taylor and Francis Group. et al., A.a. (n.d) Building and Landscape.?
11. G.B. Tobey (1973) A history of American Landscape architecture, American Elsevier Publishing Co., NY.
12. Hill, P. (2004) Contemporary history of garden design, Birkhauser publishers.
13. Jellico, G.a.S. (1995) The Landscape of Man, Thames & Hudson Publication.
14. Lehrman, J. (1980) Earthly Paradise- Garden and courtyard in Islam, Thames and Hudson.
15. Maria, C.B.J. (n.d) Mastaedi Arain: Landscape Design Today, Spain.
16. Newton, N.T. (n.d) Design on the Land: The Development of Landscape Architecture
17. Repishti, P.a.F. (2003) Dictionary of today's landscape designers, Skira Editores P.A.

SECOND SEMESTER

MLAR121 - Landscape Architecture Studio II	Subject Category	JC
	Number of Credits	12
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	12

Objectives:

- To develop the skill to integrate various knowledge systems to arrive at a design proposal of an urban scale, the process used for the same.

Course Content:

Exercise related to the application of Urban landscapes and public realm in a range of situations directed towards understanding and proposing design possibilities in:

- Urban Open Space
- Residential Landscapes - Group Housing and Gated communities
- Campus Landscape
- Urban Streets

Professional Communication II:

Advanced language skills in relation to technical writing and professional communication. Develop Professional techniques in digital media.

Total Period 180

Outcome :

Students finishing this course will be able to:

1. Understanding the function and structuring of outdoor spaces would be the underlying theme.
2. Develop a design proposal by evaluation the prerequisites of various stakeholders.

References:

1. C, H.T. (1998) Land Form Designs , P D A Publication.H, P.P. (n.d) Concrete Floors Finishes .
2. Michael, L. (1988) Tree Detailing, London: Butterworth Architecture.
3. Michael, L. (1993) Landscape Detailing Vol.1 Enclosure.
Stevens, D. (2002) Ultimate Water Garden Book.

MLAR122– Ecology ,Eco System Analysis and Field Ecology	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	3
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To understand the role of the plant community in the field and to establish a broad understanding between aquatic and terrestrial ecosystems.

Unit I Evolution**9**

Earth and Life. Concept of Ecosystem, General Structure and Function:i) Energy flow, Primary & Secondary Production ii) Types of Bio-geochemical cycles; Carbon cycle, Global water cycles, nitrogen cycle, bioaccumulation and bio-magnifications iii) Analysis and evaluation.

Unit II Concept of ecosystem services**9**

Types of Ecosystems, Plant Community in general:i) Structure ii) Concept of ecological Succession and Maturity, Types of succession iii) Analysis iv) Description and Evaluation Ecological conditions of India, Eco systems and forest types of India. Phyto geographical regions of India.ecosystem functioning, analysis and types of habitat and behavior.

Unit III Systems Ecology**9**

Introduction to systems approach and mathematical models in ecology;Population Census techniques

Unit IV Field Ecology**9**

Quadrat, line transect, community analysis, Field work and laboratory analysis of data

Unit V Selected topics in ecosystem management**9**

Climate change – causes and consequences, Aquatic ecology – fresh water and marine

Total Period**45****Outcome :**

Students finishing this course will be able to:

- Understand the various aspect of environmental concepts and about plant community prevalent to landscape architecture
- Examine and to create models of various community of ecosystems in detail through various techniques.

References:

- Odum, E.P. (1959) Fundamentals of ecology , 5th edition, America: University of Georgia.
- Keith, R. (1974) Man, nature and ecology , Aldus book limited.
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- Kluwer academic publishers (2018) Landscape Ecology, 3rd edition, Netherlands: Springer Netherlands.

4. Ambasht, R.S. and Ambasht, N.K. (2002) Modern Trends in Applied Terrestrial Ecology, Istedition, US: Springer US.
5. Jr., G.T.M. (2004) Living in the Environment: Principles, Connections, and Solutions, Brooks / Cole publishers co.
6. K, R.A. (n.d) Modern Trends in Applied Terrestrial Ecology .
7. Kormondy, E.J. (1969) Concepts of Ecology , 4th edition, Prentice Hall.Landscape Ecology, Kluwer Academic Publishers.
8. Marsh, W.M. (1997) Landscape planning – Environmental Application, John Wiley and sons Inc.
9. Plant Ecology, Kluwer Academic Publishers.

MLAR 123 – Theory of Landscape Architecture II	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To develop an understanding of contemporary landscapes and as to how ecological and social issues have been resolved in them; and understanding regional scale of landscape architecture and its allied aspects.

9

Unit I Evolution of the Modern Landscape

Impact of Industrialization and urbanization. Development of the concept of public open spaces. Public park as a major component of urban landscape. Growth and development of Landscape as a profession, Modern garden design and innovations in landscape architecture, the environmental movement, large scale regional planning, the works of F.L.Olmstead, and other pioneers, significant landscape architectural projects of the past century.

Unit II Social and Cultural Dimensions of Landscape

9

An introduction to social and cultural dimensions of landscape, Cultural landscapes their definition, identification, characteristics, policies, Sacred landscape and Historic Urban Landscape, Green pilgrimage network, Historic landscape preservation issues, Environmental and Behavioral theories: Entropy, Prospect and Refuge, Defensible space etc.

Unit III Landscape Urbanism

9

Open space development in new towns and urban renewal to illustrate the close conceptual relationship between town planning, urban design and landscape architecture. Case studies. New development in urban Landscape design.

Unit IV Contemporary Concepts and Concerns

9

Concept of sustainable landscape development, Multifunctional landscape, landscape fragmentation, urban agriculture, water and climate sensitive urban landscapes, and emerging issues, Works of contemporary Landscape Architects.

Unit V Indian Context

9

Development and evolution of the landscape profession in India. Issues in contemporary India, Analysis and understanding of philosophies of contemporary landscape works in India, case studies

Total Period 45**Outcome :**

Students finishing this course will be able to:

- Appreciate and analyze the different design concepts, philosophies and strategies in the works of prominent Landscape Architects

- Comprehend and discuss contemporary and emerging concepts in the field of landscape architecture in response to environmental, ecological and cultural issues.

References:

1. Boult, Elizabeth and Chip Sullivan, 'Illustrated History of Landscape Design', Hoboken, John Wiley and Sons, New Jersey, 2010.
2. McHarg, I.L. (1995) Design with Nature, Wiley.
3. Pregill Philip and Nancy Volkman, 'Landscapes in History, Design and Planning in the Western Tradition', John Wiley and Sons Inc, New York, 1999.
4. Rogers, Elizabeth Barlow, 'Landscape Design: A Cultural and Architectural History', Harry N. Abrams, Inc, New York, 2001.
5. Shaheer, M. (2013) Landscape Architecture in India : A Reader, LA Journal of Landscape Architecture
6. Swaffield, Simon, 'Theory in Landscape Architecture', University of Pennsylvania Press, Philadelphia

MLAR124 –Plants and Design	Subject Category	TC+S
	Number of Credits	5
	Lecture Periods per Week	2
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	3
	Total Periods per Week	5

Objectives:

- To develop an enhanced understanding of the plant material in Landscape Design and to examine the characteristics of Plants with reference to the plant material in design.
- To develop an integrated understanding of ecological planting, plants establishment and horticulture practices.

Unit I Orientation to Plant & Application**15**

Planting design through the ages - a historic perspective, Planting as a design element for structuring the landscape, Differentiation between trees, shrubs, ground cover and creepers. Planting for appearance of form, leaf colour and texture, branching habit and trunk form and their texture, colour of flowers and fruits. Spring, winter, summer and autumn variation in appearance.

Unit II Plants Arrangement**15**

Visual, aesthetic and functional considerations in planting design. Planting for visual effect and accent. The role of plant material in environmental improvement, (e.g. soil conservation, modification of microclimate). Planting for shelter, windbreaks and shelter belts.

Unit III Plants and Ecology**15**

Planting in various environments such as woodlands, forests, rural areas, urban areas, roadside planting in urban and rural areas, industrial sites etc. Planting design for habitat such as grasslands, woodlands, sloping areas, marshes, bogs, wetlands, waterside and aquatic planting etc. Planting design and ecological considerations, stratification of plant material in nature, herbal plants and their uses.

Unit IV Plants Establishment**15**

Plants and sustainability, Growth rate of plants as a criterion for plant choice for particular situations. Comparison of advantages and disadvantages of fast, medium and slow growing trees. The concept of nurse planting. Creating conditions for plant establishment, planting and transplanting trees and shrubs.

Unit V Horticulture Practices**15**

Maintenance of plant material; The preparation of planting concepts, planting plans and plant schedules for various scales of project. Nursery establishment and Plant propagation. Establishment and maintenance of grass, shrubs and trees with respect to: ground preparation. Pruning Common plant pests, diseases and their control; manures and insecticides and their application. Protection of plant material. Water Budgeting. Equipment for landscape maintenance.

Total Period**75**

Outcome :

Students finishing this course will be able to:

- Annotating the fundamentals of planting design.
- Analyzing the role of plants in natural & designed environments.
- Appreciate & use plant material as one of the important landscape design elements in addressing ecological, functional, cultural and visual aspects of the environment.
- Develop the planting design concept.

References:

1. Hackett, B. (1979) Planting Design, McGraw Hill.
2. N.H, N.R. (2004) The Planting Design Handbook, England: Ashgate Publishing Limited.
3. Walker, T.D. (1991) Planting Design, John Wiley and Sons
4. Richard Austin, John Wiley & Sons (2002), Elements of Planting Design,
5. Nick Robinson (2016) The Planting Design Handbook
6. GW Reid (2007) From Concept Form in Landscape Design
7. Gang Chen (2011) Landscape Architecture: Planting Design Illustrated (3rd Edition)
8. Nigel Dunnett, James Hitchmough (2008) The Dynamic Landscape: Design, Ecology and Management of Naturalistic Urban Planting.
9. N. Dunnett (2019) How to Design High-Impact, Low-Input Gardens: The Essential Guide
10. Dr. Deepa Maheshwari (2023) Indian Plantarum (A compendium of Phytogeographic zones and Plant lists)
11. Henk Gerritsen Piet Oudolf (2019) Planting the Natural Garden

MLAR125-Site Planning and Landscape Engineering II	Subject Category	TC+S
	Number of Credits	4
	Lecture Periods per Week	2
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	4

Objectives:

- To develop an advanced understanding of a site and the surroundings, with a whole-to-part approach on a holistic basis. Students must examine the natural, cultural, and social systems that affect design decisions, as well as the language and literature of landscape architecture. Studies to be undertaken on land development planning to appraise students in environmental, economic, legal, and visual issues associated with the land planning process.

Unit I Site Appraisal and Site Mobilization**9**

Components of Landscape Engineering and their consideration in Site Planning and Landscape design. Appraisal of site factors in large scale developments with above correlation. Advanced mapping technology for analysis. Site mobilisation; Sequence of site activity, site protection measures, site implementation checklist.

Unit II Site and Water Regime**9**

Landscape Engineering and water conservation; Watersheds and their characteristics, protection of natural water bodies: water retention structures, water harvesting techniques and devices. Traditional water systems. Water efficient landscape design. Irrigation: Broad systems and their utility as per plantation typology.

Unit III Landscape Reclamation and Rehabilitation**9**

Understanding Land/environmental modifications and engineering intervention in: Soil conservation and erosion control measures; Land reclamation and rehabilitation process; Disposal of sludge, fly-ash, solid and liquid waste; Strip-mines and quarries; Transportation corridors.

Unit IV Landscape Rejuvenation**9**

Design of sustainable landscape features such as bio-swales, bio retention ponds etc. Urban lake management. Decentralized wastewater treatment

Unit V Landscape Technology and Estimation**9**

Landscape detailing of terrace/roof, water features/ water bodies. Estimation of costs for civil works and plantation works. Preparation of bill of quantities, specifications and Tender documents.

Total Period 45**Outcome :**

Students finishing this course will be able to:

- Interpret the various site engineering techniques in their landscape design.
- Take conscious decision on understanding the environmental friendly concepts of site planning in their landscape design.

References:

1. ines, C.W.H.N.T. (2001) Time saver Standards for Landscape Architecture, Mc. Graw Hill.
2. Hack, K.L.a.G. (1984) Site Planning , MIT PRESS.
3. Hamid, S. (1985) Urban Design Process , Van Nostrand Reinhold.
4. Hopper (n.d) Landscape Architectural Graphic Standards Student Ed., John Wiley and Sons Inc.
5. Ingels, J.E. (1992) Landscaping – Principles & Practices , Pelmer Publishers Inc.
6. Lovejoy, D. (1973) Land use and Landscape Planning, Barnes & Noble.
7. Lynch, K. (1994) A Good City Form , MIT PRESS.
8. Mukoda, N. (1990) Street furniture, Bijutsushuppan – sha Ltd.
9. Niall, K.a. (n.d) The Art of Landscape Detail: Fundamentals, Practices and Case Studies.
10. Reid, G.W. (1987) Landscape Graphics, Watson , New York: Guptill publication.
11. Liptan Thomas W (2017) Sustainable Stormwater Management: A Landscape-Driven Approach to Planning and Design
12. Bruce G. Sharky (2015) Landscape Site Grading Principles: Grading with Design in Mind
13. Valerie E. Aymer(2020) Landscape Grading: A Study Guide for the LARE

MLAR 126 - Geoinformatics for Landscape Architecture	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	3

Objectives:

- To understand the basics of geoinformatics, data acquisition, processes, and interpretation. Students shall learn GIS-based analysis which links to the very heart of landscape architecture in a natural and intuitive way. GIS in landscape architecture helps to put forward some characteristic principles of study and practice that can be made operational via GIS while cultivating spatial intelligence in landscape design by exploiting its powerful integrating, analytical, and graphical capacities.

Unit I Overview of Remote Sensing

9

Definitions, Processes, and Characteristics of Remote Sensing Systems, Advantages and limitations, Concept of Electromagnetic Radiation (EMR), Sources of Energy –Active and Passive Remote sensing, Remote Sensor Platforms and Satellite Orbits, Types and Characteristics of Sensor, Multispectral and Hyperspectral sensors, Radar, Lidar; Specification of some popular satellites – IRS, Landsat and SPOT series; High-resolution satellites – IKONOS, Carto sat, Quick bird, Orb View, GeoEye, Worldview, Other latest earth resource satellites, Remote Sensing Scenario in Indian Context.

Unit II Application of Remote Sensing in Resource Management

9

Bio-Resources: Agriculture, forest resources and wildlife habitat assessment. forest density and type, issues in forest management. Water Resources: Remote sensing application in surface and sub-surface water resources evaluation, water mining and pollution, and water resource management issues. Geoinformatics Models in Resource Management: Forest Fire Modelling, Wild Life Habitat Assessment modelling, Soil Erosion modelling, Land Resources Development Prioritization modelling.

Unit III Introduction to Geographical Information Systems

9

Definition, Composition of Geographical Information System, Computer Hardware Module, GIS Software Module, Data Input, Data Storage, Data Output, Database Structures, Conversion between Raster and Vector Spatial Analysis: Types of Spatial Analysis, Measurement in GIS, Query – Query by Attributes, Spatial Queries, Attribute-Based Operation, Neighbourhood Analysis, Connectivity Analysis, Overlay and Coverage Rebuilding, Data Quality and Errors in GIS, Web GIS, Mobile GIS.

Unit IV Map Preparation for Rural, Urban and Regional Studies

9

Base Map, Choropleth maps, Land use Land Cover-Supervised and Unsupervised, NDVI, NDBI, NDWI, Watershed delineation Map, Flood Risk Mapping, Drought Mapping, 3-D GIS Digital Elevation Model & Digital Terrain Model, Digital Image Processing and Editing.

Unit V GIS in Landscape Research

9

GIS-based visibility analysis, GIS-based reconstructions of Urban, rural, and regional landscape and Temporal Analysis, GIS-based spatial association

analysis of the distribution and allocation of the cultural and natural landscape, GPS-monitoring of pedestrian movement, Use of Open Street mapping, and Various Open sources. Use of Drone for aerial Mapping and Surveying.

Total Period 45

Outcome :

- Students finishing this course will be able to understand the basics of geoinformatics, data acquisition, processes, and interpretation. Students shall learn GIS software packages over different exercises to understand all the themes discussed in the syllabus.

References:

1. Batty, D.M.a.M. (ed.) (2005) GIS, Spatial Analysis and Modeling, ESRI Press.
2. C, H.T (1998) Land Form Designs, P D A Publication.
3. C. Hanna, K. (1999) GIS for Landscape Architects, ESRI press.
4. G.S.Srivastava (2014) An Introduction to Geoinformatics, McGraw Hill Education.
5. Garcia, J. (2017) Introduction to Geographic Information System, Larsen and Keller Education.
6. Mitchell, A. (2005) Geographic patterns and Relationships, ESRI Press.
7. Stevens, D. (2000) Ultimate Water Garden Book , 01st edition, Conran.

THIRD SEMESTER

MLAR211 - Landscape Architecture Studio-III	Subject Category	JC
	Number of Credits	12
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	12

Objectives:

- To make the students understand the workings of a large site/ area of regional scale, including its design, implementation and management factors with the involvement of stakeholders.

Course Content

Relatively large scale exercise of analysis and proposals related to ecologically sensitive landscape of the following typology:

- Urban or Rural Landscapes
- Cultural Landscapes
- Eco-Tourism projects

Professional Communication III

Advanced language skills in relation to technical writing and professional communication with agencies associated with planning and design viz., planning authorities, statutory bodies, clients, contractors and other professionals.

Total Period 180

Outcome :

Students finishing this course will be able to:

- Understand the working of natural processes and ecosystems in relation to the proposed projects and their design requirements.
- Develop landscape guidelines, masterplan and design proposals for large scale sites involving complex situations applying ecological principles and keeping in view the requisites of various stakeholders.

References:

1. Geoffrey, Geoffrey, & Jellicoe. (1975). The landscape of man. Thames and Hudson.
2. Hack, G. (2018). Site Planning. Willey Publication.
3. Hamid, S. (1985). Urban Design Process.
4. Harg, I.M. (1995). Design with Nature (Wiley Series in Sustainable Design), John Wiley and Sons.
5. Lovejoy, D. (1973). Land use and Landscape Planning.
6. Lyle, J. T. (1999). Design for human ecosystems: Landscape, land use, and natural resources. Island.
7. Lynch, K. (1984). A Good City Form.
8. Simonds, J.O. (1985) Landscape architecture - A manual of site planning and design.
9. Tom, T. (1995) City As Landscape. Taylor & Francis.

MLAR 212 - Landscape Economics, Project Management, Horticultural Practice and Professional Practice	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	3
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To develop an integrated understanding of economics, landscape management, project management and Professional practice which is a prerequisite for landscape design and planning.

Unit I Landscape Economics**9**

Cost and benefits related to open space development; Tangible costs of development; capital and maintenance costs: intangible costs, modification of ecological systems rehabilitation cost. Unit cost of development of open space. Assembling the land for urban development; legal issues; social and cultural issues; economic incentives.

Unit II Economic Valuation**9**

Assessing monetary value of fragile and unique landscape and landscape resources. Various methods for determining landscape-derived economic benefits.

Unit III Landscape Management**9**

Landscape management at the regional scale in relation to soil conservation, water management, grassland management, forestry and agriculture. Management practices related to urban ecology and urban habitats, such as urban forests, river banks, regional parks and green belts: ecological, economic and administrative issues. Management models.

Unit IV Project Management**9**

Project Management: Types of projects, Various stages of the project, Project management process, Time and Cost management, Project life cycle.

Unit V Professional Practice**9**

Regulations and legal aspects, Sequence of activities from inception to completion, Construction documents, Contract procedure, Contract Documentation, Types of clients, forms of agreement; conditions of engagement; scope of work and services to be provided, Scale of professional fees; Professional code of conduct.

Total Period 45**Outcome :**

Students finishing this course will be able to:

- Analyse the role of landscape architects in developing open spaces and various economic models of open space development.
- Understand the process of landscape management practices at regional level.
- Summarize of code of conduct and landscape consultancy practices.

References:

- Conrad, J. M. (1999). Resource Economics. Cambridge University Press.
- Field, B. C. and Field, M. K. (2006). Environmental economics. McGraw-Hill/Irwin.

3. Hanley, N., Shogren, J. F., and White, B. (1997). Environmental economics in theory and practice. Oxford university press, New York.
4. Kolstad, C. D. (2003). Environmental economics. Oxford university press.
5. Solow, R. M. (1993). An almost practical step toward sustainability. Resources policy, 19(3):162–172.
6. Varian, H. R. (2007). Intermediate microeconomics: A modern approach. W. W. Norton & Company.
7. Daly, H. E. and Farley, J.(2004) Ecological Economics: Principles and Applications. Washington, D.C.: Island Press
8. John Parker(1989), Landscape Management and Maintenance: A Guide to its costing and organization, Routledge
9. Publications of the Indian Road Congress
10. Code of professional practice and competition guidelines of Council of Architecture

MLAR 213 Sustainable and Energy Efficient Landscape	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To impart knowledge on sustainability and energy efficiency in landscape architecture and its application in landscape planning or landscape design process

Unit I Understanding the Sun and Climate 9

Earth's Climatic zones; distribution of heat and precipitation, prevailing winds, Solar radiation, Solar charts, transfer of energy in the atmosphere, greenhouse gases; Seasons and plant growth

Unit II Sustainability and Energy Efficiency 9

Concept of sustainability, Energy efficiency: Meaning and definitions Need for adopting Energy efficient landscape design techniques. Rating systems - Design parameters and certification criteria for landscapes, sustainable and resilient landscapes, Application at various scales

Unit III Microclimate and Landscape 9

Landscape elements for microclimatic modification - Radiation, Wind, Temperature, humidity & precipitation modification; Thermal comfort and landscape elements

Unit IV Sustainable Site Planning and Landscape design 9

Various methods of energy conservation in landscape architecture, Passive design strategies in various climates; Energy efficient site planning and landscape development, Energy efficient planting design ,Water- energy nexus, water conserving landscape design, Embodied energy in landscape design.

Unit V Sustainable Landscape Practices 12

Case studies and examples of Energy efficient landscapes practices globally and locally. Tools and techniques for evaluating energy efficient site planning and landscape development

Total Period 45**Outcome :**

Students finishing this course will be able to :

- Apply various climate responsive and energy efficient landscape design strategies in landscape projects of varied scales.

References:

- Brown, R. D., & Gillespie, T. J. (1995). Microclimatic landscape design: creating thermal comfort and energy efficiency (Vol. 1). New York: Wiley.
- CPWD (2013) Integrated Green Design for Urban & Rural Buildings in Hot-Dry Climate Zone
- GRIHA Version 2019 Manual (Volume I)
- Haque, M. T., Tai, L., & Ham, D. (2004). Landscape design for energy efficiency.

5. Krishan, A et.al(2001), Climate Responsive Architecture: A Design Handbook For Energy Efficient Buildings, McGraw Hill
6. Oke, T. R. (2002). Boundary layer climates. Routledge. - Chapter 5 - "Climates of non-uniform terrain"
7. Schultz, J., & Schultz, J. (2005). The Ecozones of the World: The Ecological Divisions of the Geosphere. Springer Science & Business Media. Berlin, Heidelberg. https://doi-org.aurarialibrary.idm.oclc.org/10.1007/3-540-28527-X_1
8. Seçkin, N. P. (2018). Environmental control in architecture by landscape design. A/Z ITU J. Fac. Archit, 15, 197-211.
9. Vashist, A. Energy efficient landscapes: a case study in the national capital region of Delhi. NAGARLOK VOL. LII, Part 4, October
10. John.F.Benson and Maggie.H.Roe, Landscape and sustainability, John Wiley Publication, New York, 2000.

MLAR214 - Landscape Resources and Conservation	Subject Category	TC
	Number of Credits	4
	Lecture Periods per Week	4
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	4

Objectives:

- To expose students to application of landscape planning techniques and to develop an understanding of landscape resources and its importance to conserve, protect and maintain for environmental benefits and well-being.
- To comprehensively make the students understand the impacts of proposed development projects, enabling them to work out alternatives, so that wherever possible significant negative impacts may be avoided, minimized, or mitigated.

Unit I Settlements and Landscape**8**

Siting and evolution of cities in relation to regional landscape character ; Water management in ancient / historic cities- Greek, Roman, Indian, etc.Traditional Knowledge systems. Illustrative studies of cities in India and elsewhere.

Unit II Landscape Heritage**8**

Open space systems, cultural and sacred landscapes, their typology and role in the development of cities. Landscape resources specific to distinctive city types viz., religious centres, historic cities, coastal or port cities, hill station etc.

Unit III EIA**12**

Theory and Practice. Definitions, methodologies, techniques Illustrative examples from India and elsewhere (EIA in developed and developing countries) to demonstrate the degree of effectiveness. Role of Environmental Legislation and the Ministry of Environment and Forests and climate change. Environmental criteria for location of human settlements or any major land based activity viz industries/ dam sites ; applicability of EIA to various development programs;integration of EIA methodology to landscape design; environmental planning and management strategies and approaches relevant to urban and regional planning.

Unit IV Landscape Conservation**8**

The concept of Landscape Planning and Landscape Conservation: definitions and scope. Landscape Assessment techniques. Priorities, Policies and Programmes; study of various charters related with landscape conservation; Landscape Conservation in Indian Context, Environmental conservation, National parks and other protective designations. Biodiversity and Biosphere reserves. Endangered landscapes. Landscape conservation and its significance (natural resources such as soil, water, vegetation etc) Aspects of watershed management; Conservation of historic landscapes, HULs, UNESCO's recommendations for the Historic Urban Landscapes, safeguarding methods.

Unit V Development control rules

9

Zonal Plans and structure plan. Development controls and their role in the conservation and creation of urban landscape. Overview of landscape resources at the national level: National Environment Policy; Developmental and Environmental issues associated with particular landscape regions, mountain and hill areas; deserts and wastelands; river and aquatic systems, coastal and estuarine regions, etc.

Total Period

45

Outcome :

Students finishing this course will be able to:

- Demonstrate knowledge of landscape planning techniques and how to apply GIS and remote sensing in regional Landscape Planning.
- Understand the different steps within environmental impact assessment and explain the methodologies and techniques of environmental impact assessment in India through case studies.
- Understand the significances of landscape conservation

References:

1. Allaby, M. (2000) Basics of Environmental Science, Routledge.
2. H.N.Tiwari (1997) Environmental Law, Allahad Law Agency.
3. Mukul.G.Asher, A.a. (2000) Environment and the developing world, John wiley and sons, Inc.
4. Rosencranz, Diwan ,S .and.Noble,.M.L (1991) Environmental law and policy in India (Cases, Materials, and status), Tripathi Bombay.
5. Canter, L. W(1996) Environmental Impact Assessment, McGraw – Hill.
6. Ndubisi, F.(2002) Ecological Planning: A Historical and Comparative Synthesis, JHU Press
7. Selman,Paul(2012) Sustainable Landscape Planning:The Reconnection Agenda,Routledge
8. Selman Paul(2006) Planning at the landscape scale,Routledge

MLAR215 Research Methodology	Subject Category	JC
	Number of Credits	5
	Lecture Periods per Week	2
	Tutorials per week	3
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	5

Objectives:

- To make the students understand the process of carrying out research and equip students with skills to articulate findings of their research
- To effectively programme the Thesis for the fourth semester.

Unit I Introduction to Research**6**

What is research? Research versus faith, research versus project, philosophical and theoretical basis; Research philosophies – positivistic, phenomenological, anthropological; Research terminology; Types of Research – exploratory, descriptive, analytical, predictive; Research approaches – quantitative/ qualitative/mixed, basic/ applied, deductive/ inductive

Unit II Research Process**6**

Elements of Research process: finding a topic- writing an introduction- stating a purpose of study- identifying key research questions and hypotheses- reviewing literature- using theory- defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis- illustration using research samples.

Unit III Data Collection and Analysis**6**

Data and data sources - Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- - criteria of selecting samples. Qualitative and quantitative data analysis.

Unit IV Technical Writing**6**

Research writing in general - Components: referencing - Writing the bibliography - Developing the outline – presentation etc. Ethics in Research – Plagiarism – Thesis Chapter Development – Time Schedule – Publication and Peer Review Process

Unit V Dissertation**51**

Topics related to various aspects of Landscape Architecture would be chosen in consultation with faculty members. The lectures will assist the student in research methodologies, conducting of surveys, identifying case studies etc.

Under the direction of a supervisor and review panel, individual students shall carry out comprehensive study and research on the chosen topic, and present the findings in a 5000 to 8000 worded report with illustrations and references.

Total Period 75

Outcome :

- Dissertation report on initial exploration of identified research area to supplement 4th Semester Thesis topic.

References:

- 1.Booth, W. C., Colomb, G. G., & Williams, J. M. (2003). The craft of research. University of Chicago press.
- 2.Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.
3. Deming, M. E., & Swaffield, S. R. Landscape architecture research: inquiry, strategy, design. 2011, Hoboken.
- 4.Denzin, N., & Lincoln Y, The Landscape of qualitative research: Theories and issues.2nd ed. Thousand Oaks: Sage, 2003
- 5.Foss, S. K. (2015). Destination dissertation: A traveler's guide to a done dissertation. Rowman & Littlefield.
6. Groat, L. N., & Wang, D. (2013). Architectural research methods. John Wiley & Sons.
7. Van den Brink, A., Bruns, D., Tobi, H., & Bell, S. (Eds.). (2016). Research in landscape architecture: Methods and methodology. Routledge.

MLAR216 - Summer Training	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	-

Objectives:

- To facilitate exposure for students to practical facets of Landscape Architecture and thus add value to the teaching learning process.

Course Content:

Students are required to undertake Training in suitable firms which are relevant to the body of knowledge, for a period of Six weeks at the end of Second Semester. This will be evaluated as part of the Course Structure of Third Semester.

Total period

Outcome :

Students finishing the training will be able to

- Understand and apply the professional aspects of a landscape architecture firm and the multiple issues in conception, preparation and execution of project on a site.

FOURTH SEMESTER

MLAR221 Thesis	Subject Category	JC
	Number of Credits	24
	Lecture Periods per Week	-
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	24
	Total Periods per Week	24

Objectives:

- To provide the students an opportunity towards application of the knowledge gained in an independent Thesis, with a design or a research focus, to arrive at a creative thoughtful design or findings, enriching the field of landscape architecture.

Course Content:

Thesis may be either Thesis by Design Or Thesis by Research

The design thesis is an independent design on a topic defined by the student, leading to the development of a Landscape Planning or Landscape Design proposal with appropriate details. The thesis by research is an independent research on a topic defined by a student culminating into a methodology / policies/ guidelines/conceptual design proposals based on the research findings.

The progress of work will be reviewed periodically throughout the semester by a reviewing committee.

Total Period 240

Outcome :

Students finishing this course will be able to:

- Apply the systematic/methodological learning from their education and training in an independent thesis, with a design or a research focus.
- Handle a complete a project of their own choice, with a design or a research focus, in a practicable manner using their creative ability

ELECTIVE I

MLAR221 - The Future Cities	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To understand the components and dynamics of the future cities, and the importance of technological advancements for the cities of the future.
- The course explores the latest research and development on how to better understand, create and manage the future cities for a more resilient urban world.

Unit I Evolution of cities, and Cities of the Future **9**

Understand a city's people, components, functions, scales and dynamics, as precondition for its sustainable design and management. Analysis of layers of cityscapes like citizen and communities, city services, soft and hard (ICT and non-ICT based) infrastructure, natural environment, socio-cultural factors, Government policies and laws etc. Examples of smart services around the world, Future Vision for Smart City of various countries.

Unit II Future Cities Concepts and Models **9**

Scale related Sustainable Built Environment - Human Scale, Neighbourhood Scale, City Scale, and Landscape Scale. Key Concepts of Sustainable Cities - Zero Energy, Quality of life, City Resilience, Green Infrastructure etc. Bio-city, Smart city, Sustainable city, Compact city, Inclusive city, Intelligent city, Eco-city, Green city etc.

Unit III Sustainable Urban Development **9**

Different Architectural Perspectives on Sustainable Urban Development - Integrated Development, multi-disciplinary approach, governance. Global and National sustainable development objectives like Sustainable Development Goals, New Urban Agenda, City Liveability Framework, National Mission on Sustainable Habitats etc. Global Climate Agreements - UNFCCC, Kyoto Protocol, Montreal Protocol, COP, Paris Agreement etc.

Unit IV Cities and Natural Capital **9**

Environment as a capital - Ecosystem services and natural capital assets. Natural capital accounting. Natural capital assessments in city governments. Framework for Ecological Planning.

Unit V Future Cities in Digital Media **9**

Depiction of future cities in movies, video games, mobile apps etc. Correlation between the cities in digital media and the real works of architecture and urban design. Understanding Speculative Technology and concepts like utopian and dystopian world, post-apocalyptic universe, alternate reality, virtual worlds with respect to the cities of the future. Application of AI Tools for imagining the cities of future.

Total Period **45**

Outcome :

Students finishing this course will be able to:

- Develop the ability to critique city development processes and become sensitive towards understanding various nuances of cities. This can also help to forecast cities for a better future.

References:

1. Dobraszczyk, P. (2019). Future Cities: Architecture and the Imagination. Reactio Books.
2. Hall, P. (1998). Cities in Civilization. Pantheon.
3. Mitchell, W.J. (1998). City of bits: space, place, and the infobahn. MIT Press.
4. Monchaux, N. (2016). Local code: 3659 proposals about data, design and the nature of cities.
5. Muller, W. (2008). The metapolis dictionary of advanced architecture: city, technology and society in the information age.
6. Ratti & Claudel . (2016). The city of tomorrow: sensors, networks, hackers, and the future of urban life. Yale University Press.

MLAR-222 - Interior Landscape	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	-
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objectives:

- To develop an enhanced understanding of plant materials suitable for the interior environment. Plant arrangement and special compositions and development of favourable growing conditions.

Unit I Physical Requirements of Plants in Indoor Environment **9**

Light, water, humidity, air quality and planting medium Distinguish between different types of indoor plants. Describe the cultural methods used for growing various indoor plants Select appropriate plants for different interior plantscaping situations

Unit II Plants Arrangements **9**

Design principles for plants arrangements for space creation. Design Objectives, Character of Interior Plants, Design Suggestions and commonly used plants for interior environment.

Unit III Plants Establishment **9**

Engineering facilities in interior landscaping, substrate design and possibilities, water requirement and strategies, climate requirement and strategies, Structural requirements and acclimatization of plant materials for indoor environment.

Unit IV Plants Installations & Display **9**

Green walls/ Moss walls, terrarium , bonsais, planted aquarium / aquasacping and Nano jungles and Land art.

Unit V Emerging Concepts **9**

Patterns of basophilic design, urban jungles, plants for mental health, productive landscape in indoor environment, contemporary trends for development of Indoor landscape.

Total Period **45****Outcome :**

Students finishing this course will be able to:

- Profound understanding of planting design for indoor environment.
- Techniques and process of plants design and development.
- Exposure to contemporary trends of interior landscaping

References:

1. Walker, T.D. (1991) Planting Design, John Wiley and Sons
2. Elements of Planting Design, Richard Austin, John Wiley & Sons, Inc., New York, 2002
3. Niall, K.a. (1999) The Art of Landscape Detail: Fundamentals, Practices and Case Studies.
4. Jerome Malitz ,Seth Malitz Interior Landscapes(2002) – Horticulture & Design: Horticulture And Design :W. W. Norton & Company; Illustrated edition.
5. Vernon, S., Tennant, R., & Garmory, N. (2013). Landscape architect's pocket book. Routledge.
6. Steele, J. (1993). Interior landscape dictionary. John Wiley & Sons.
7. Corbo, S. (2016). Interior landscapes: a visual atlas. images Publishing.

MLAR223 – Movement Corridor	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To understand the various opportunities for integrating the urban landscape and conservation of natural systems to enhance the urban ecology.
- The subject explores fundamental concepts of wildlife corridors .landscape fragmentation and habitat conservation.

Unit I Introduction**9**

Introduction to concept movement corridor- impact, significance, context and scale. The evolution and role of corridors in landscape planning and habitat conservation.

Unit II Urban Movement**9**

Strategies for landscape planning and urban development to establish urban corridors: pedestrian, Non-motorised transport, greenways, urban linkages and greenbelts. Vehicular movement corridors, the highways, the forest roads.

Unit III Urban Ecology**9**

Conservation and regeneration of urban open space systems, urban forests, and urban natural systems. Corridor ecology and landscape planning framework. Multifunctional ecological corridor in urban landscape. Movements of animals through linkages; landscape linkages, dispersal corridors. Urban watershed ecology.

Unit IV Wildlife Movement**9**

Fundamental concepts in wildlife connectivity. The Theory of Island Biogeography, Metapopulation Theory, Metapopulation and Dispersal, Metapopulations Key Concepts, Landscape fragmentation, patch connectivity, Habitat Patches. Movement of multi-habitat species between landscape elements; Corridors and the functioning of metapopulations.

Unit V The Conservation of Habitat and Landscape:**9**

Measurement of habitat use; Heterogeneity, Landscape gradients and patch dynamics; Problems of habitat loss, Isolation, and fragmentation; Edge effects; Managing habitat connectivity: The role of corridors in habitat conservation. Linkages in forest conservation and management.

Total period**45****Outcome :**

Students finishing this course will be able to:

- Develop a comprehensive understanding of the subject to resolve issues pertaining to landscape planning.
- Concept, theories and approaches of wildlife movement and urban ecology and habitat conservation

References:

1. Hilty J, Lidicker Jr. WZ, Merenlender A (2006) Corridor Ecology: The Science and Practice of Linking Landscapes for Biodiversity Conservation; CRC Press
2. Wiens JA, Moss MR (2005) Issues and Perspectives in Landscape Ecology; Cambridge University Press.
3. Ilan C , Martin F, Jennifer H (2015) Land Restoration: Reclaiming Landscapes for a Sustainable Future; Academic Press
4. Edward T. McMahon, Mark A. Benedict ,(2006) Green Infrastructure: Linking Landscapes and Communities.
5. Charles A. Flink (2020) The Greenway Imperative: Connecting Communities and Landscapes for a Sustainable Future
6. D Farr (2008) Sustainable Urbanism - Urban Design with Nature
7. Billy Fields (2021) daptation Urbanism and Resilient Communities: Transforming Streets to Address Climate Change (Advances in Urban Sustainability)
8. Brita Brenna, Janike Kampevold Larsen, Mari Hvattum (2011) Routes, Roads and Landscapes: Routledge; 1st edition
9. Fischer, E. E., Hohmann, H., & Marriott, P. D. (2000). Roadways and the Land: The Landscape Architect's Role. Public Roads, 63(5), 30-34.

MLAR223 – Green Infrastructure	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorials per week	1
	Studio/Lab/Workshop/Practical's	-
	Total Periods per Week	3

Objectives:

- To provide an understanding of the concept of green infrastructure and develop methodological and technical knowledge in green infrastructures planning and design.

Unit I Introduction 9

Hydrological Cycle and Impact of urbanization, Concept of green infrastructure and definition, Grey Infrastructure Vs Green Infrastructure, Environmental, and socio-economic benefits of Green Infrastructure.

Unit II Concepts Related to Green Infrastructure. 9

Ecosystem services, green infrastructure, ecosystem-based adaptation and nature-based solutions; Water Sensitive Urban Design Sponge City, Hydro-ecological infrastructure; Multi-stakeholder participation, WSUDP

Unit III Green Infrastructure at Different Scales of Urban Areas 9

City and Regional scale - Canals, Forests, Reservoirs, Road and railway networks, greenbelts, Regional parks, Lakes and wetlands, Rivers and floodplains. Neighbourhood and Site scale – bioswales, detention and retention ponds, Green roofs, Green walls, and Permeable surfaces.

Unit IV Green Infrastructure Approach 9

Scope of GI interventions in urban areas, Green infrastructure approach - Coastal cities, Inlands and desert areas, Urban areas with hills, Urban areas with floodplains, case studies in various urban contexts.

Unit V Green Infrastructure in India 9

Evolution of GI in India, Potential of GI in India, Initiatives and Case Studies.

Total period 45**Outcome :**

Students finishing this course will be able to:

- Demonstrate an understanding of the tools to conceptually plan a green infrastructure system.
- Apply methodologies, procedures and techniques for green Infrastructures planning and design in multiple spatial scales.

References:

- Austin, G. (2014). Green infrastructure for landscape planning: integrating human and natural systems. Routledge.
- Benedict & McMahon, 2006, Green Infrastructure: Linking Landscapes and Communities.
- Dover, J. W. (2015). Green infrastructure: incorporating plants and enhancing biodiversity in buildings and urban environments. Routledge.
- Matto, M., Jainer, S., & Sharda, C. (2017). Water-sensitive Urban Design and Planning: A Practitioner's Guide. Centre for Science and Environment.
- Sinnett, D., Smith, N., & Burgess, S. (Eds.). (2015). Handbook on green infrastructure: Planning, design and implementation. Edward Elgar Publishing.
- Rohilla, S. K., Jainer, S., & Matto, M. (2017). Green infrastructure: A practitioner's guide. Delhi, India: Centre for Science and Environment.
- Washbourne, C L & Wansbury C (2022) ICE Manual of Blue-Green Infrastructure, ICE Publishing.

Master of Architecture

(Sustainable Architecture)

Course Structure and Detailed Syllabus for
Two-Year Masters Degree Programme in Architecture

Effective from the Academic Year 2024-25 onwards

(As Approved by the Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाडा
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Master of Architecture (Sustainable Architecture)

Course Structure

FIRST SEMESTER

SL. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods per week			Total Periods Per Week	CREDITS
			L	T	S/P		
1	MSAR111	Design Studio I (Simple Passive Strategies)	3	-	12	15	15
2	MSAR112	Building Physics and Sustainability	2	1	-	3	3
3	MSAR113	Sustainable Materials & Construction Techniques	2	1	-	3	3
4	MSAR114	Daylight and Lighting Design	1	-	2	3	3
5	MSAR115	Environmental Codes and Energy Ratings	2	1	-	3	3
6		Elective I	2	1	-	3	3
	MSAR1110	Traditional Wisdom and Sustainability Concepts					
	MSAR1111	Resource Conservation and Efficiency					
		Open Elective (MOOC courses) as PBOC	-	-	-	-	-
TOTAL			12	4	14	30	30

SECOND SEMESTER

SL. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods per week			Total Periods Per Week	CREDITS
			L	T	S/P		
1	MSAR121	Design Studio II (Advance Passive Strategies)	3	-	12	15	15
2	MSAR122	Solar Passive Design	2	1	-	3	3

3	MSAR123	Urban Climate and Thermal Comfort	2	1	-	3	3
4	MSAR124	HVAC & IAQ	1	-	2	3	3
5	MSAR125	Research Methodology	2	1	-	3	3
6		Elective II	2	1	-	3	3
	MBEM1211	Waste Management					
	MBEM1212	Healthy Buildings					
	MUD125	Liveable Cities					
		Open Elective (MOOC courses) as PBOC	-	-	-	-	-
TOTAL			12	4	14	30	30

THIRD SEMESTER

SL. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods per week			Total Periods Per Week	CREDITS
			L	T	S/P		
1	MSAR211	Design Studio III (Whole Building Simulation and Evaluation)	3	-	12	15	15
2	MSAR212	Decarbonizing Buildings- Embodied and Operational Carbon	2	1	-	3	3
3	MSAR213	Energy Audit & Post Occupancy Evaluation of Buildings	2	1	-	3	3
4	MSAR214	Dissertation	-	-	6	6	6
5		Elective III	2	1	-	3	3
	MSAR2110	Project Management					
		Sustainable and Energy Efficient Landscape					
		Open Elective (MOOC courses) as PBOC	-	-	-	-	-
TOTAL			9	3	18	30	30

FOURTH SEMESTER

SL. NO.	SUBJECT CODE	SUBJECT TITLE	Distribution of Periods per week			Total Periods Per Week	CREDITS
			L	T	S/P		
1	MSAR221	Thesis	3	-	24	27	27
2		Elective IV	2	1	-	3	3
	MBEM222	Building Information Modelling and Management					
		Open Elective (MOOC courses) as PBOC	-	-	-	-	-
TOTAL			5	1	24	30	30

Detailed Syllabus for Master of Architecture (Sustainable Architecture)

FIRST SEMESTER

MSAR111 - Design Studio - I (Simple Passive Strategies)	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	03
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Objective:

To understand and analyse, climate and its elements at both micro and macro level and design projects of varied scales with passive strategies.

To use concepts learn in other theory subjects in semester 1, reg. Thermal properties of building materials and appropriate bio climatic analysis using various software and other tools, in the design projects. As part of the studio project, a real time building site visit, documentation, assessment of architectural strategies incorporated and quantitatively analyzing through a preliminary exercise.

Design Studio that explores strategies for sustainable practices, design, theoretical and/or technological issues that focus for proper scientific architectural thought and practice to lead to climate-responsive, energy efficient and environmentally friendly solutions. Our built environment has a substantial impact on energy consumption and material resources as well as being a critical determinant of health, comfort, environmental quality and productivity for occupants. In response, there are numerous local, national, and international entities adopting green, sustainable criteria for new construction and renovations. This studio design approaches sustainable development for buildings by examining physiology required for human function (comfort, ergonomics, and respiratory requirements, as well as sensory perception) and then by considering how building components and systems affect human performance and well-being. Sustainable development starts with site planning and evaluation, and proceeds through design, construction, commissioning, and occupancy phases. The strategies explored during the course shall culminate into design application. The scale, size and typology of design are left to the faculty. Incorporating context-appropriate simple passive strategies requires a substantial dedication and investment of student's time and skills, both during and after official class hours. For the same, the students are to use appropriate software and other relevant tools for bio-climatic analysis using psychrometric chart, for identifying the appropriate passive design strategies. Students are also needed to develop understanding of the thermal properties of building materials and apply the same while designing to ensure enhanced climate responsiveness and energy-efficiency in the built forms they design. As a part of their involvement, students are required to actively participate in all lectures, discussions, readings, assignments, design tasks as a class group and/or individually. The design and lab-oriented work must be actively in progress on a daily basis for data collection and development of design

Total: 240 Periods

MSAR112 - Building Physics and Sustainability	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

The aim of the course is to introduce climatic and building physics parameters and understand the role of building physics in designing a climate responsive and energy efficient building for enhanced occupant comfort.

Unit-I**10**

Earth-Sun relationship, Global Climate, Scales & magnitude of impact: Global Scale, Local Scale, Building Scale, Climatic zones in India, Interpretation of climatic elements through Climate Data, Sun Path diagrams and solar geometry, Psychrometric Charts, Bioclimatic charts and their applications. Thermal comfort, indoor and outdoor thermal comfort, thermal comfort indices .Use of instruments like data loggers/ anemometer for thermal/ wind data recording and carrying out related studies/exercises.

Unit-II**10**

Heat insulation, absorptivity, emissivity, reflectivity, thermal conductivity, thermal damping, thermal performance index, thermal resistance, thermal transmittance, thermal time constant and time lag. Thermal behaviour of multi layers: body, surface conductance, air-to-air resistance, cavity resistance, solar control, radiation calculations, solar heat gain - periodic heat flow calculations

Unit-III**10**

Calculation of principle building energy gains and losses. Estimation of building energy performance for heating and cooling for different climatic contexts. Use of instruments like data loggers/ anemometer for thermal/ wind data recording and carrying out related studies/exercises.

Unit-IV**9**

Reduction Heat Transfer or Enhancement, insulation properties of materials and built forms. Radiation versus other Heat Transfer Methods, Evaluating various built form (Vernacular, State of art and other buildings) and its components / or materials for comfort conditions with respect to thermal, visual and air movement.

Unit-V**9**

Appropriate Case Studies

Total: 48 Periods**Outcome:**

Students shall learn the physics of buildings, how building works with respect to climate, material usage, form etc. The science behind heat transfer etc shall also be discussed.

References

1. Hens, H. S. L. C. (2023). Building Physics - Heat, Air and Moisture: Fundamentals, Engineering Methods, Material Properties. With Exercises. Germany: Ernst & Sohn.
2. Pinterić, M. (2021). Building Physics: From Physical Principles to International Standards. Germany: Springer International Publishing.
1. Martin Zeumer, Sebastian El Khouli, and Viola John (2015)., 'Sustainable Construction techniques.', Detail Green Books., First Edition.
2. Mark DeKay (2011)., 'Integral Sustainable Design: Transformative Perspectives', Earthscan., First Edition.
3. Andrew Scott (1998)., 'Dimensions of Sustainability', E & FN SPON, Routledge.
4. K. Steemers and Nick Baker (2000)., 'Energy and Environment in Architecture: A Technical Design Guide', Taylor & Francis.
5. David Thrope (2014)., 'Energy Management in Buildings: The Earthscan Expert Guide', Routledge.
6. Marko Pinterić (2017)., 'Building Physics: From physical principles to international standards.', Springer.
7. T.R.Oke (2002)., 'Building Layer Climates', Second Edition, Routledge.
8. Steven V. Szokolay, Introduction to Architectural Science: The basis of sustainable design, Architectural Press, 2004.
9. DeKay, M., & Brown, G (2001)., Sun, Wind & Light: architectural design strategies, Tehran: Parham Naghsh.

MSAR113 - Sustainable Materials and Construction Techniques	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To introduce the concepts of sustainable building materials and construction techniques

Unit-I**10**

Introduction to Sustainable Building Materials: Environmental impact of building materials, physical & thermal properties of materials etc. Embodied energy and Life cycle assessment of materials, steel, fly ash bricks, gypsum, steam cured bricks, mud, bamboo, eco-boards etc

Unit-II**10**

Classification of Building materials, selection of materials, Life Cycle assessment of Materials – Biodegradable & Non-Biodegradable Materials, bio materials - Concept of Recyclable and salvaged materials – Nontoxic materials, low VOC paints, adhesives, alternative flooring materials

Unit-III**10**

Traditional Building Materials & techniques – Introduction to traditional and alternative materials & construction techniques: Fly ash bricks, gypsum, steam cured bricks, mud, bamboo CSEB, steam cured blocks etc., & Cavity walls, core unit slabs, filler slabs, composite beam and panel, funicular shells, filler slabs, reinforced concrete masonry, vaulted roofs, ferro-cement walls etc

Unit-IV**9**

Efficiency of materials for sustainability: Minimization of natural resource & water utilization, use of demolition waste, salvaged material - High volume fly ash concrete, geo polymer concrete etc., Importance of envelope material for thermal control – Specifications for walls and roofs for different climates – case studies

Unit-V**9**

Smart & innovative materials for green construction- GFRC, Mycelium, Hempcrete, timbercrete blocks, WPC, SCIP etc., latest technologies in construction- 3D printing, Building Integrated Photo Voltaic (BIPV), smart finishes for walls.

Total: 48 Periods**Outcome:**

At the end of the course, students should be able to

- Understand about sustainable building materials and construction techniques
- Comprehend about properties of the building materials and its impact on environment
- Know about traditional building materials and construction techniques relevant to the present context
- Comprehend about efficiency of the building materials and embodied energy component
- Know about technologically innovative and smart building materials

References

- Ross Spiegel (2012), Green Building Materials, Wiley
- TERI, (2004), Sustainable Building - Design Manual Pt 1 & 2, The Energy and Resources Institute.
- Spiegel, R., & Meadows, D. (2010). Green building materials: a guide to product selection and specification. John Wiley & Sons.
- Jagadish. K.S.(2008) Alternative Building Materials and Technologies, New age International Pvt Ltd Publishers.

2. Rider, T. R., Glass, S., & McNaughton, J. (2011). Understanding green building materials. WW Norton & Company.
3. Van Lengen, J. (2008). The barefoot architect: a handbook for green building. Shelter Publications, Inc..
4. Sinopoli James (2010), Smart Building materials For Architects, Owner, Builders, Butterworth Heinemann
5. Eccleston, Charles H, (2013), Environmental impact assessment: a guide to best professional practices, Boca Raton
6. Glasson, John and Therivel, Riki, (2005), Introduction to environmental impact assessment, Routledge
7. Linda Reeder, (2010), Guide to Green Building Rating System, Wiley
8. Steve Goodhew, (2016), Sustainable Construction Process, Wiley
9. Satyajit Ghosh and Abhinav Dhaka (2016), Green Structures: Energy Efficient Buildings, CRC Press
10. Kibert, C. J. (2016). Sustainable construction: green building design and delivery. John Wiley & Sons.

MSAR114 - Daylight and Lighting Design	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	3

Objective:

To impart the scientific aspects of daylight and environmental lighting.

10**Unit-I**

Electromagnetic spectrum. Visual response visual acuity, Glare & visual comfort, adaptation glare, Colour perception, Concept of Kruith of curve, Visual Task Requirements. Side lighting concepts, Top lighting concepts.

Unit-II**10**

Daylight Controls. Daylighting Design, Daylighting in Architecture, Indoor and outdoor light, Illuminance levels for different types of activities as per National Building Code, 2016 standards, Daylighting Analysis Electrical light sources and Luminaires. Daylight metrics for Task requirements such as point-by-point method, Lumen method, simulation tools. Qualitative calculations and Supplementary Artificial Lighting.

10**Unit-III**

Lighting Design – Effect of light on user orientation, room comprehension, form, structure and materials. Lighting in peripheral and core zones, Impressions of visual clarity, spaciousness, relaxation, privacy etc. Interior lighting design requirements for offices, factories, commercial interiors, museums and galleries, etc.

Unit-IV**9**

Exterior lighting: Functional requirements, buildings and facades, pedestrian routes and surrounding areas, parking areas and landscape lighting. Designing Atria / Light Courts. Emergency lighting: Escape lighting, shutdown lighting and standby lighting, equipment and system design. Integration of daylight and artificial lighting. Economics of supplementary lighting.

Unit-V**9**

Cost-effective daylighting design, energy efficiency and maintenance. Lighting cost, performance of lamps and luminaires. Estimating energy use. Energy saving developments.

Total: 48 Periods**Outcome:**

Students shall learn the appropriate metrics of artificial and daylight, processes of quantification and their applications.

References

1. Susan M. Winchip (2017)., 'Fundamentals of Lighting'., Fair Child Books, Bloomsbury., 2nd Edition.
2. Mark DeKay, G. Z. Brown (2014)., 'Sun, Wind & Light'., Wiley., Third Edition.
3. Michael Wilson and Peter Tregenza (2011)., 'Daylighting: Architecture and Lighting Design'., Routledge.
4. Norbert Lechner (2009)., 'Heating, Cooling, Lighting: Sustainable Design Methods for Architects'., Wiley.
5. Hopkinson, R. G (1963)., 'Architectural Physics – Lighting', HMS Office, London.
6. MEBc Schiler (1992)., 'Simplified Design of Building Lighting'., John Wiley & Sons, Inc., New York.

7. Nick V. Baker, A. Fanchiotti, K. Steemers (2017)., 'Daylighting in Architecture: A European Reference Book', Earthson from Routledge.
8. Boubekri, Mohamed. (2008) Day Lighting, Architecture and Health - Building Design Strategies, Architectural Press, Elsevier, ISBN: 978-0-7506-6724-1.
9. Szokolay, Steven V. (2014), Third Ed., Introduction to Architectural Science-The Basis of Sustainable Design, Routledge, ISBN:0750687045

MSAR115 - Environmental Codes and Energy Ratings	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To expose students the various environmental codes and energy ratings as on date.

Unit-I**10**

Global Energy issues & Environmental crisis, Resource extractions, The Energy scenario and use in different sectors, Energy and built environment, Sustainable Development goals, different milestones on sustainable development and related environmental protocols, Construction sector and sustainability.

Unit-II**10**

Role of Ministry of New & Renewable Energy (MNRE) and Bureau of Energy Efficiency (BEE) in Sustainable Development, Introduction to Energy Codes & Energy efficiency in Buildings, Energy Conservation Building Code (ECBC-2017) – Commercial & Eco-Niwas Samhita (ECBC-R) (ENS-2018), guidelines & evaluation & certification procedure, Role of ECBC Expert/Design professional .

Unit-III**10**

Introduction to Green Building Certification & Rating systems, International rating systems like BREEAM, LEED, Green Mark, BEAM etc, Indian Rating systems like, GRIHA (National Green building rating system of India), IGBC etc, Role of The Energy resource Institute (TERI), overview of Rating system & Certification procedure, Incentives to green buildings, Green Building Accreditation & role of Green building Consultant, case studies of rated buildings

Unit-IV**9**

The Energy Conservation Act, 2001 & Amendment Act, 2010, Objectives of Bureau of Energy Efficiency (BEE), Energy efficiency schemes and measures like Star Rating of Appliances, National Mission for Enhanced Energy efficiency (NMEEE), Demand Side Management, Buildings Energy Efficiency, Awareness and Institutional mechanism

Unit-V**9**

The Environment (protection) Act 1986, rules to regulate environment pollution and Prevention, control and abatement of environmental pollution and institutional mechanism.

Total: 48 Periods**Outcome:**

Awareness about applicable environmental codes, and relevant energy rating system procedures and protocols shall be explored.

References

1. International Building Code – 2012., International Code Council., 2011.
2. National Building Code – 2016., Bureau of Energy Efficiency., Ministry of Power., Govt. of India.
3. Linda Reeder (2010)., 'Guide to Green Building Rating System', Wiley.
4. The Environment (protection) Act 1986. Link:
https://indiacode.nic.in/bitstream/123456789/4316/1/ep_act_1986.pdf – accessed on 06.07.2019.
5. The Energy Conservation (Amendment) Act 2001, and Amendments -
<http://extwprlegs1.fao.org/docs/pdf/ind167070.pdf> – accessed on 06.07.2019.

6. Energy conservation building code 2017. Link:
https://beeindia.gov.in/sites/default/files/BEE_ECBC%202017.pdf - – accessed on 06.07.2019.
7. Eco-Niwas Samhita 2018. Link:
https://www.beeindia.gov.in/sites/default/files/ECBC_BOOK_Web.pdf – accessed on 06.07.2019.
8. National building code – India. NBC 2016 Vol 01 - Link:
[https://ia800601.us.archive.org/13/items/nationalbuilding01/in.gov.nbc.2016.vol1.digital.p](https://ia800601.us.archive.org/13/items/nationalbuilding01/in.gov.nbc.2016.vol1.digital.pdf)
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<https://ia800601.us.archive.org/11/items/nationalbuilding02/in.gov.nbc.2016.vol2.digital.p>
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9. International building code. IBC 2018. Link:
<https://www.ci.independence.mo.us/userdocs/ComDev/2018%20INTL%20BUILDING%200CODE.pdf> – accessed on 06.07.2019.
10. International Energy Conservation Code.IECC2018 Link:
<https://basc.pnnl.gov/resources/2018-iecc-international-energy-conservation-code> –
accessed on 06.07.2019.
11. Bureau of Energy Efficiency, Ministry of Power, Govt. of India. Link:
<https://beeindia.gov.in/> – accessed on 06.07.2019.
12. LEED. Link: <https://igbc.in/> – accessed on 06.07.2019.
13. GRIHA. Link: <http://www.grihaindia.org/> – accessed on 06.07.2019.

SECOND SEMESTER

MSAR121 - Design Studio - II (Advance Passive Strategies)	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	03
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

In this Design Studio students learn and hone their architectural design skills and are required to apply the knowledge gained from theory courses in the design solutions. Typically, at the end of the Design Studio, each student or team is required to explain the key concepts and integrated design philosophy with evidence based output of application of advanced passive systems. In order to propagate knowledge and learning, it is important to create networks, establishing platforms that can encourage sharing of ideas and information. The design process should facilitate the same. Subjects with high technical content need elaboration with examples as well as explanation of basic rules of thumb that are widely used in the profession. This results in application of building physics, review of literature from previous design works and energy efficiency concepts with the overall building design sensibility. A broad spectrum of topics such as Solar passive cooling strategies, solar passive heating strategies, energy efficiency, Building Physics, Building Diagnostics which is climate responsive, role of building and energy appliance codes, in designing sustainable buildings with the help of primarily laboratory and supported by simulation software tools is expected. Periodic heat transfer model of a non –air conditioned building comprising of heat balance equations for inside air, periodic heat flux through walls, roof, isothermal mass, conduction through floor/ ground, windows and heat loss through ventilation and infiltration etc., analysis of thermal trap roof and walls, solar thermal models for direct and indirect gain such as underground floor storage , earth air tunnels, earth covered structures, rock bed storage, phase change materials for conditioned and non-air conditioned buildings The strategies explored during the course shall culminate into design application. The scale, size and typology of design is discretionary.

Incorporating advanced passive strategies requires a substantial dedication, and understanding in addition to investment of student's time and skills, both during and after official class hours. As part of their involvement, students are required to actively participate in all lectures, discussions, readings, assignments, design tasks as a class group and/or individually. The design and lab-oriented work must be actively in progress on a daily basis for understanding the advanced passive strategies theoretically, its application with the help of case studies and development of design as a response to the climate type.

Total: 240 Periods

MSAR122 - Solar Passive Design	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

The main objective of this course is to equip the students with the understanding of advanced solar passive design techniques in traditional architecture and modern scientific theories in buildings.

Unit-I**10**

Introduction of passive solar architecture, evolution of built forms in response to climate, appreciation of built form for different climates, building clusters and solar exposure, thermal environment, advantages of solar passive design strategies.

Unit-II**10**

Passive heating: direct gain heating, indirect gain heating: thermal storage wall - Trombe wall, Water wall and Transwall, thermal storage roof / skytherm and convective loop, isolated gain heating: sun space / attached solarium / conservatory. Case studies

Unit-III**10**

Passive cooling: natural cooling, shading, convective cooling. Passive cooling strategies, thermal sinks of passive cooling. Approaches to passive cooling- night ventilation cooling, ventilation cooling, radiative cooling and evaporative cooling - direct and indirect evaporative cooling.

Unit-IV**9**

Earth sheltered / earth bermed structures, cool roofs, green roofs. Various augmentation techniques: Earth Air Heat Exchanger (earth-air tunnels), wind tower, solar chimney.

Unit-V**9**

Modern and postmodern passive architecture, methods, strategies, systems, and construction details emphasizing the passive architecture and non-active services. Appropriate Case studies

Total: 48 Periods**Outcome:**

Students shall learn about the various solar passive design strategies and their applications in design of buildings.

References

1. Engström, J. (2024). Reducing energy demands of modern buildings: Utilizing vernacular architecture, passive solar design & natural materials.
2. Haggard, K., Bainbridge, D. A., & Aljilani, R. (2016). Passive solar architecture pocket reference. Routledge.
3. Chen, C. J. (2024). Physics of Solar Energy and Energy Storage. John Wiley & Sons.
4. Bainbridge, D., & Haggard, K. (2011). Passive solar architecture: heating, cooling, ventilation, daylighting and more using natural flows. Chelsea green publishing.
5. Givoni Baruch, "Passive and Low Energy Cooling of Buildings", Van Nostrand Reinhold, New York, 1994.
6. Sodha, M., Bansal, N. K., Bansal, P. K., KuMEB, A., and Malik, M. A. S., "Solar Passive Buildings", Pergamon Press, Oxford, 1986.
7. Bansal Narendra, K., Hauser Gerd and Minke Gernot, "Passive Buildings Design: A Hand book of Natural Climatic Control", Elsevier Science, Amsterdam, 1994.
8. Goulding, John, R., Lewis, Owen, J., and Steemers, Theo, C., "Energy in Architecture", Bastford Ltd., London, 1986.

MSAR123 - Urban Climate & Thermal Comfort	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Studio/Lab/Workshop/Practical's	1
	Total Periods per Week	3

Objective:

The main objective of this course is to equip the students with the understanding of urban climate scales, energetic basics of outdoor thermal comfort and data and instrumentation for outdoor thermal comfort studies.

8**Unit-I**

Fundamentals of Urban Climate- Urban Climate and Urban Scale. Scale of Climatic Study: Atmospheric Scales - Urban Climate and Urban Scale. Scale of Climatic Study: Climatological Scales - Urban Climate and Urban Scale.

Unit-II**10**

Urban Morphology - Urban Canopy Models. Geometry of an Urban Canyon - Urban Canopy Models. Air-flow and Albedo in Urban Canopy Layer - Urban Canopy Models.

Unit-III**10**

Energy Efficient Urban Development - Energy Efficient Neighbourhoods and Cities. Energy Balance of Urban Surfaces. Energy Balance of Vegetated Surfaces. Energy Balance of Water Systems.

Unit-IV**8**

Thermal Comfort Basics - Outdoor Thermal Comfort Basics. Thermal Comfort Indices - Outdoor Thermal Comfort. PET and UTCI - Outdoor Thermal Comfort

Unit-V**12**

Instrumentation, sensors, field measurements, tools and techniques for data collection. Use of computer applications and tools in urban climate studies

Total: 48 Periods**Outcome:**

Students shall learn the fundamentals of urban physics, metrics for comfort studies and their applications in neighbourhood level studies.

References

1. Oke, T. R., Mills, G., Christen, A., & Voogt, J. A. (2017). Urban climates. Cambridge University Press.
2. Lau, K. K., Tan, Z., Morakinyo, T. E., & Ren, C. (2021). Outdoor thermal comfort in urban environment: Assessments and Applications in Urban Planning and Design. Springer Nature.
3. Parsons, K. (2019). Human thermal comfort. CRC Press.
4. Stewart, I. D., & Mills, G. (2021). The urban Heat Island. Elsevier.
5. Paolini, R., & Santamouris, M. (2022). Urban climate change and heat islands: Characterization, Impacts, and Mitigation. Elsevier.

MSAR124 - HVAC & IAQ	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	3

Objective:

To educate the students on the concepts and techniques of HVAC systems and IAQ

Unit-I**10**

Ventilation systems (Natural and Mechanical), designing for natural ventilation, impact of building form, layout and window design on ventilation systems (outdoor and indoor), comfort ventilation, process ventilation, ventilation requirements for various building functions, ventilation standards, estimating air changes, urban wind characteristics, boundary layer and wind pressure coefficient, Types of ventilation, night purging (ventilation), structural cooling, mechanical and mixed mode ventilation systems, Mechanical ventilation systems for residential and commercial, industrial buildings.

Unit-II**10**

History and evaluation of mechanical cooling systems, basics of Air Conditioning (AC), Carnot refrigeration cycle, Psychrometry: terms and air-conditioning processes; Thermal comfort, Type of cooling and heating systems, terminology; humidification and dehumidification, fans, evaporative cooling systems, unitary systems (Window AC, Split AC) to packaged air conditioning and central AC systems; water cooled and air-cooled systems, precision air conditioning, components of chilled water plants, cooling towers, condensers, air handling units, supply and return air ducts

Unit-III**10**

Cooling/ heating load estimation, fresh air requirements; heat recovery systems, sustainable air conditioning, Global warming potential (GWP) of refrigerating materials, environmental friendly refrigerants, advanced air conditioning systems, energy efficiency in air conditioning, hybrid cooling/ heating systems, direct-indirect evaporative cooling systems heat pumps for cooling and heating, solar air conditioning, vapour compression systems.

Unit-IV**9**

Indoor air quality (IAQ), building related illness (BRI), sick building syndrome (SBS), types of outdoor and indoor pollutants and health impacts, Indoor pollution mitigation methods, filtration, dilution by ventilation, portable air filtration systems, dampers and duct design for ventilation, kitchen hoods, exhaust systems, jet ventilation systems, Outdoor and indoor air quality standards (NBC, ASHRAE, etc.), methods and models for designing desirable levels IAQ. IAQ and health, Causes of SBS, air contaminants of indoor origin, International standards, IAQ in offices, residential and commercial and Industrial buildings etc., NBC, ASHRAE guidelines for ventilation.

Unit-V**9**

Building management system (BMS), controls in air conditioning, dampers, instrumentation, field surveys, data collection, measurements and methods for testing building air tightness, concentration decay methods, water table and wind tunnel methods for measuring natural ventilation and wind profile, basics of building energy components and air conditioning/ ventilation system audit.

Total: 48 Periods

References

1. Wines James & Jodido Philip, "Green Architecture – The Art of Architecture in the age of Ecology", Tachen Publishers, New York, 2000.
2. Mackenzie Dorothy, "Green design: design for the Environment", Laurence King, London, 1997.
3. Farmer John & Richardson Kenneth, "Green Shift: Changing attitudes in architecture to the Natural World", Architectural Press, Boston, 1999.
4. The European Commission, "A Green Vitruvius: Principles and Practices of Sustainable Architectural Design", James & James, London, 1999.
5. Fred A. Stitt, "The Ecological Design Handbook", McGraw Hill, New York, 1999.
6. Scott Andrew, "Dimensions of Sustainability: Architecture, Form, Technology, Environment & Culture", F&FN Spon, London, 1998.

MSAR125 - Research Methodology	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

1. To impart the basics of research methods in architecture
2. To enable students to write research papers
3. To equip students with skills to articulate findings of their research

Unit-I: Introduction to Research**9**

What is research? Research versus faith, research versus project, philosophical and theoretical basis; Research philosophies – positivistic, phenomenological, anthropological; Research terminology; Types of Research – exploratory, descriptive, analytical, predictive; Research approaches – quantitative/ qualitative/mixed, basic/ applied, deductive/ inductive.

Unit-II: Research Components**9**

Elements of research process: finding a topic - Writing an introduction - Stating a purpose of study identifying key research questions and hypotheses - Reviewing literature using theory, defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis - illustration using research samples.

Unit-III : Review of Literature**10**

Library and archives - Internet: new information and the role of internet, finding and evaluating sources of misuse - Test for reliability ethics.

Unit-IV: Data Collection and Analysis**10**

Methods of data collection - From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling - Problems encountered in collecting data from secondary sources, processing and analysis of data.

Unit-V: Technical Writing**10**

Writing & publishing the research work in journals - Research writing in general - Components: referencing - Writing the bibliography - Developing the outline – presentation etc. - Case studies - illustrating how good research can be used from project inception to completion - Review of research publications. Ethics in Research – Plagiarism – Thesis Chapter Development – Time Schedule – Publication and Peer Review Process related to particular subject domain.

Total: 48 Periods**Outcome:**

Students shall learn about the different research methods application and relevant for them. Reading and writing papers and research proposals shall also be discussed.

References

1. Wayne C Booth, Joseph M Williams, Gregory G Colomb, The Craft of Research, 2nd Edition, Chicago guides to writing, editing and publishing, 1995
2. Iain Borden, Kaaterina Ruedi, The Dissertation: An Architecture Student's Handbook, Architectural Press, 2000
3. Ranjith Kumar, Research Methodology - A step by step guide for beginners, Sage Publications, 2005
4. John W Creswell, Research design: Qualitative, Quantitative and Mixed method approaches, Sage Publications, 2002
5. Linda N. Groat, David Wang, Architectural Research methods, Wiley, 2nd edition, 2013

THIRD SEMESTER

MSAR211 - Design Studio - III (Whole Building Simulation and Evaluation)	Subject Category	SC
	Number of Credits	15
	Lecture Periods per Week	03
	Studio/Lab/Workshop/Practical's	12
	Total Periods per Week	15

Introduction of simulation strategies related to thermal, visual, embodied energy performance of different components and parameters, energy analysis for building covering approximate methods, correlation methods, and simulation methods. Students have to gain a deep understanding of various aspects of sustainable building such as energy performance, water performance, embodied energy, embodied carbon, response to disaster (resilience), financial implications, innovative approaches and value additions through wholistic studies. These learnings have to be applied in their design and proved using simulation. The process could also be evidence-based approach to arrive at the best results.

The simulation studio shall culminate into critical evaluation of applied strategies using advanced computation and simulation tools of how efficient the building is in terms of energy performance, water performance, embodied energy, embodied carbon, response to disaster (resilience), financial implications, innovative approaches and value additions. The scale, size and typology of design is discretionary. However, the output has to be in terms of acceptable numbers layered with a design output sensitive to the social, cultural and economic context. Simulation studio requires a substantial dedication, and investment of student's time and skills, both during and after official class hours for using the tools and running the simulation. As a part of their involvement, students are required to actively participate in all lectures, discussions, readings, assignments, design tasks as a class group and/or individually. The design and lab-oriented work must be actively in progress on a daily basis for collection readings and development of design.

Total: 240 Periods

MSAR212 - Decarbonizing Buildings- Embodied and Operational Carbon	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To create awareness, exposure and educate the students with ways of decarbonizing buildings by understanding the embodied carbon of building materials and operation carbon of buildings

Unit-I**6**

Introduction to GHG and the role of buildings in its reduction, GHG, GWP, Sectors contributing to GHG, Global initiatives to reduce GHG, India's Initiative to reduce GHG, India's current scenario in Economic, Social, Environmental and Energy, India's commitment to reduce GHG, Net-zero commitment, Mission 2070

Unit-II**10**

Strategies to reduce GHG in Building Industry, Bioclimatic Architecture, Renewable energy integration, Low carbon Materials, Low carbon footprint, Energy Efficient Technologies. Environment friendly materials and construction processes that suggest future value; concepts such as designing for adaptability, disassembly, reuse, reduced waste or energy self-sufficiency promise new innovations

Unit-III**10**

Embodied energy, embodied Carbon, Ways to reduce embodied Carbon, EPD, Material and system selection strategies, building disassembly, reuse-reduce-recycle building materials, Cradle to gate, India's measures to reduce Embodied and operational carbon, Embodied energy of building materials, building materials, high embodied energy, low embodied energy, recycled building materials, whole life carbon, Comparison of Embodied carbon of various materials, High carbon, low carbon and carbon negative building, embodied energy of recycled materials, sequestered carbon, recycled materials

Unit-IV**10**

Operational energy, Operational Carbon, measures to reduce Operational Energy, Integration of renewable energy systems, Energy Efficient fixtures, Star Rating of Appliances, Sensor application, Occupant Behaviour, building sector energy transformation potential in India, Factors influencing operational energy, strategies, Efficient building operations, building envelope, HVAC systems, Lighting systems, Building Management systems, smart technology, Carbon offsetting, Challenges to reduce Operational Energy

Unit-V**12**

Appropriate Market and Case Studies, Use of Tools to assess Embodied and operational carbon, EDGE, Athena, One Click LCA, EPIC.

Total: 48 Periods**Outcome:**

At the end of the course, students should be able to

- Recognize the basic concepts of embodied carbon and the distinctions between energy usage, embodied carbon, carbon emissions, and energy savings throughout the course of a building's life.
- Understand the problems, constraints of the present, and potential developments in data, whole-life building optimization, and embodied carbon.
- Be aware of how to use tools and resources to help with technical and design practice understanding and application of embodied carbon solutions.

- Be able to resolve embodied carbon issues in real-world situations and develop Skills to be able to use design strategies to minimize the whole of life carbon impact of a project.

References

1. Jankovic, L. (2024). Designing Zero Carbon Buildings: Embodied and Operational Emissions in Achieving True Zero. Taylor & Francis.
2. Azari, R., & Moncaster, A. (Eds.). (2023). The Routledge Handbook of Embodied Carbon in the Built Environment. Taylor & Francis.
3. Smith, A. D., & Gill, G. (2011). Toward zero carbon: The Chicago central area decarbonization plan. Images Publishing.
4. Clark, D. (2019). What Colour is your Building?: Measuring and reducing the energy and carbon footprint of buildings. RIBA Publishing.
5. Kuittinen, M., Organschi, A., & Ruff, A. (2022). Carbon: A Field Manual for Building Designers. John Wiley & Sons

MSAR213 - Post Occupancy Evaluation and Energy Audit of Buildings	Subject Category	JC
	Number of Credits	3
	Lecture Periods per Week	1
	Studio/Lab/Workshop/Practical's	2
	Total Periods per Week	3

Objective:

To impart the post-occupancy evaluation and Energy Audit tools and techniques prevalent in the field.

Unit-I**9**

Understanding of the conceptual frameworks underlying different types of post-occupancy. Evaluation. POE objectives and needs. The generic attributes such as to identify and formulate the problems and to envisage, enact processes in response to them. Assessing existing buildings on their energy use, environmental impact and occupant satisfaction. Building performance benchmarks – rating and comparison of buildings.

Unit-II**9**

Techniques, methods & procedures of Post Occupancy Evaluation. It also covers the user satisfaction survey identifying areas of deficiency, particularly in maintenance, and facilitates the assessment of the overall performance of the building

Unit-III**9**

General Aspects of Energy Management & Energy Audit. Energy Efficiency in Thermal Utilities and Energy Efficiency in Electrical Utilities, Energy Performance Assessment for building envelope, fenestration and embodied energy, it also emphasizes Equipment and Utility systems.

Unit-IV**9**

Detailed energy audit, quantify energy consumption and establish baseline energy information, Construct energy and material balance, · Perform efficiency evaluation of energy & utility systems, compare energy norms with existing energy consumption levels, · Identify and prioritization energy saving measures and analysis of technical and financial feasibility of energy saving measures, study of energy efficient technologies and alternate energy sources.

Unit-V**12**

Appropriate Case Studies: Students are required to carry out post-occupancy evaluation of a building document the relationship between building design, energy use, occupant satisfaction, and environmental impact and report their observations.

Total: 48 Periods**Outcome:**

Students shall learn the required post-occupancy and energy audit procedures and protocols for assessing the buildings for their performance and suggesting appropriate retrofit measures.

References

1. Moncef Krarti (2011). Energy Audit Of Building Systems An Engineering Approach. CRC Press. Florence. Taylor & Francis Group.
2. Li P, Froese TM, Brager G, Post-occupancy evaluation: State-of-the-art analysis and state-of-the-practice review, Building and Environment (2018), doi: 10.1016/j.buildenv.2018.02.024.
3. Alejandro Vásquez-Hernández and Mario Fernando Restrepo Álvarez, Evaluation of buildings in real conditions of use: Current situation, Journal of Building Engineering, <http://dx.doi.org/10.1016/j.job.2017.04.019>.
4. Ye, C.; Yao, L.; Meng, Y.; Zhang, Y.; He, G. Post-Occupancy Evaluation of Green Technologies for a High-Rise Building Based on User Experience. Sustainability 2022, 14, 9538. <https://doi.org/10.3390/su14159538>

MSAR214 - Dissertation	Subject Category	JC
	Number of Credits	6
	Lecture Periods per Week	--
	Studio/Lab/Workshop/Practical's	6
	Total Periods per Week	6

Objective:

To make the students understand the process of carrying out research and to effectively identify and formulate problems for the Thesis in the next semester.

Topics related to various aspects of sustainable architecture and built environment would be chosen in consultation with faculty members.

1. Introduction, definition, objectives of research, types of research
2. Research process, research design, types of research designs,
3. Collection of primary data, data tabulation, and analysis, to draw inferences.
4. Application of above in the dissertation topic chosen.
5. Writing and communication skills for written and oral presentations; professional communications.

Comprehensive study and research on chosen topic, presentation of findings in a series of seminars by individual students. Documentation and formal presentation as a Dissertation at the end of the semester.

Total: 96 Periods

Outcome:

The students shall prepare a thesis proposal to be carried out in the subsequent semester. This course shall help the students in developing literature, methods, tools and techniques to be adopted and develop a comprehensive proposal.

References

1. Wayne C Booth, Joseph M Williams, Gregory G Colomb, The Craft of Research, 2nd Edition, Chicago guides to writing, editing and publishing, 1995
2. Iain Borden, Kaaterina Ruedi, The Dissertation: An Architecture Student's Handbook, Architectural Press, 2000
3. Ranjith Kumar, Research Methodology - A step by step guide for beginners, Sage Publications, 2005
4. John W Creswell, Research design: Qualitative, Quantitative and Mixed method approaches, Sage Publications, 2002
5. Linda N. Groat, David Wang, Architectural Research methods, Wiley, 2nd edition, 2013

FOURTH SEMESTER

MSAR221 - Thesis	Subject Category	Thesis
	Number of Credits	27
	Lecture Periods per Week	03
	Studio/Lab/Workshop/Practical's	24
	Total Periods per Week	27

The Thesis gives the student an opportunity to apply the discipline and skills of the programme to an individually selected research topic, requiring a measure of original development, providing a vehicle for conducting an in-depth investigation, analysis and critical review of relevant material. The Thesis should reflect the Philosophy of Sustainable Architecture and the technical knowledge gained from the entire course which may include the simulations. The Thesis is the culmination of work done on the programme and is considered to be of prime importance. The process of producing the Thesis consists of a number of Thesis Workshop day long events followed by group discussions and one to one tutorial.

Each student is allocated a Thesis supervisor who is responsible for academic guidance through the process. All students are encouraged to produce a publishable paper based on the Thesis material.

At the end of the semester each student is expected to submit all the original drawings as per the department's specifications. Three copies of the report in the prescribed format set by the department have to be submitted after taking approval from the supervisor/guide.

The department shall schedule a date for the viva-voce as per the academic calendar. The performance sheet submitted by the Guide/supervisor and the Thesis committee should be the basis for allowing the student to appear for the final viva-voce.

Total: 432 Periods

ELECTIVE I

MSAR1110 - Traditional Wisdom and Sustainability Concepts	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To impart the importance of traditional wisdom and knowledge, and its relevance today.

Unit-I**10**

Socio-cultural aspects in the spatial formation of traditional buildings under different climate zones in India. Concepts of Sacred build-up and Landscape, An Architectural and Theological Interface, Indigenous knowledge, antiquity, Indian vernacular architecture concepts covering informal, functional architecture of structures, built of local materials and designs to meet the needs of the local people and the intricate variations in local social customs, craftsmanship and climate.

Unit-II**10**

The interpretations and reintroduction of spatial elements such as columns, brackets, jaalis, zarokhas, chhajas, stairs and cupolas to the remake of spatial themes such as courts, terraces, pavilions and caves related to sustainable concepts.

Unit-III**10**

Sustainable Architectural concepts in history covering Indus valley, Aryan cultures, Buddhist, Dravidian, Indo Aryan, Hoysala Architecture, Islamic, provincial style, Mughal, colonial and post-colonial architecture and components of consideration such as materials, high ventilated roofs, integrated design, lighting, ventilation, vegetation and adopting to natural environment.

Unit-IV**9**

The Architectural concepts to emphasize local conditions, geography of region and peoples mind to emphasize traditional wisdom and sustainable concepts. Reposing faith in traditional wisdom, continuum of Vernacular concepts in contemporary Indian architecture.

Unit-V**9**

Appropriate Case Studies

Total: 48 Periods**Outcome:**

Students shall learn the traditional concepts and techniques from various cases studies across the country for understanding the traditional concepts for coping up with sustainability issues.

References

1. Wines James & Jodido Philip, "Green Architecture – The Art of Architecture in the age of Ecology", Tachen Publishers, New York, 2000.
2. Mackenzie Dorothy, "Green design: design for the Environment", Laurence King, London, 1997.
3. Farmer John & Richardson Kenneth, "Green Shift: Changing attitudes in architecture to the Natural World", Architectural Press, Boston, 1999.
4. The European Commission, "A Green Vitruvius: Principles and Practices of Sustainable Architectural Design", James & James, London, 1999.
5. Fred A. Stitt, "The Ecological Design Handbook", McGraw Hill, New York, 1999.
6. Scott Andrew, "Dimensions of Sustainability: Architecture, Form, Technology, Environment & Culture", F&FN Spon, London, 1998.

MSAR1111 - Resource Conservation and Efficiency	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To sensitize and equip the students with understanding on various natural resources, assessment and conservation techniques.

Unit-I**10**

Energy Efficiency – Energy Conservation – Recourse Consumption – Introduction – Distribution of Energy use in India – Factors affecting the Energy use in Buildings – Pre-Building Stage, Construction Stage & Post Occupancy stages.

Unit-II**10**

Types of natural resources including human, material, economic etc. Need for conservation of resources. Carbon footprint assessment, concept of ecological capacity etc.

Unit-III**10**

Overview of Environmental Sciences pertaining to the above, including assessments, mapping tools and methods etc. Human interventions and ecosystem disturbances, Impact of human activities on natural resources and biodiversity, changing of the ecosystem cycles etc.

Unit-IV**9**

Local, regional and global impacts on the Environment. Introduction to wasteland creation & barren land formation, soil erosion at regional level; Kyoto Protocol, Paris Climate Change Agreement, India's climate change policy and stand. Efficient utilization of resources with case studies.

Unit-V**9**

Impacts of Urbanization on Ecology and Environment. Water management, waste and land management systems. Extreme Climate. Zero Energy Buildings, carbon neutrality.

Total: 48 Periods**Outcome:**

Students shall learn about the resource conservation concepts, ideas and strategies that are applicable for design efficient buildings.

References

1. P.S. Ramakrishnan (2002) Ecology and Sustainable Development: Working with Knowledge and System, National Book Trust
2. Michal L McKinney, Robert M Schoch, Logan Yonavjak (2013) Environmental Sciences: System and Solutions, John and Bartlett learning
3. Ping Chi and Qiang Chion (2015) Climate Change and Sustainability, Delve Publishing
4. P.N. Prasad (2010) Environmental Air Pollution: Causes, Effect and Control, Crescent Publishing Corporation
5. Steve Goodhew, (2016), Sustainable Construction Process, Wiley

Open Elective (From SPAV)	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

ELECTIVE II

MBEM1211 - Waste Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

In line with MBEM Syllabus

MBEM1212 - Healthy buildings	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

In line with MBEM Syllabus

MUD 125 - Liveable Cities	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

In line with MUD Syllabus

Open Elective (From SPAV)	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

ELECTIVE III

MSAR222 - Project Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Objective:

To impart the requirement project management skills in handling real-time project, and also to expose students the practical issues concerning projects in general.

Unit-I**10**

Introduction to Project finance & Management. Project Management: Construction projects, Project development process, project management, main causes of project failure.

Unit-II**10**

Project formulation: Generation and Screening of Project Ideas - Project identification – Preliminary Analysis, Market, Technical, Financial, Economic and Ecological - Pre-Feasibility Report and its Clearance, Project Estimates and Techno-Economic Feasibility Report, Detailed Project Report.

Unit-III**10**

Project Planning Process: Plan development process, time planning process, work scheduling process, resource planning process, Importance of planning, scheduling and controlling projects.

Unit-IV**9**

Project Finance: Introduction to project finance Means of financing, Costs associated with projects, estimates, Economic analysis of project, economic studies, sensitivity analysis. Cost estimating principles. Detailed estimates, cost concepts, classification of costs, elements of costs, Private sector participation in Infrastructure Development Projects - BOT, BOLT, BOOT.

Unit-V**9**

Working Capital Management: Concept, Need and types of Working Capital; Determination of Working Capital; Estimation of Working Capital Needs; Financing of current assets – Matching, Conservative Approach, Aggressive Approach (Problem and Theory).

Total: 48 Periods**Outcome:**

Student shall learn the various stages and phases of projects; tools and techniques available for effective implementation of projects.

References

1. Gupta, B.L. and Gupta, Amit., Construction Management, Machinery and Accounts, 3rd ed. Standard Pub, 2005.
2. Loraine, R.K, Construction Management in Developing Countries. Thomas Telford, London, 1993
3. Srinath, L.S., PERT and CPM Principles and Applications, 3rd ed. Affiliated East-West Press, New Delhi, 2003.
4. Singh, Harpal., Construction Management and Accounts 14th ed. Tata McGraw-Hill Pub., New Delhi, 1981
5. Gould, E.Frederick and Joyce, E.Nancy., Construction Project Management. Prentice Hall, New Jersey, 2000
6. Shrivastava, U.K., Construction Planning and Management, 3rd ed. Galgotia Pub., New Delhi, 2004

7. Chitkara, K.K, Construction Project management: Planning. Scheduling and Controlling. Tata McGraw-Hill Pub., New Delhi. 1999.
8. Sharma, S.C, Construction Equipment and its Management, 4th ed. Khanna Pub., New Delhi, 2004.

MLAR213 - Sustainable & Energy Efficient Landscape	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

In line with MLAR syllabus

Open Elective (From SPAV)	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

ELECTIVE IV

MBEM212 - Building Information Modelling and Management	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

In line with MBEM Syllabus

Open Elective (From SPAV)	Subject Category	TC
	Number of Credits	3
	Lecture Periods per Week	2
	Tutorial Periods per Week	1
	Total Periods per Week	3

Master of Design

Course Structure and Detailed Syllabus for
Two Year Masters Degree Programme in Planning

Effective from the Academic Year 2024-25 onwards

(As Approved by the Senate in its 17th Meeting held on 27.05.2024)



योजना तथा वास्तुकला विद्यालय, विजयवाड़ा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, Ministry of Education, Govt. of India

Course Structure and
Syllabus

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada



Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

MDES' ABC' – Masters in Design, A – Year, B – Semester, C- Subject Number

Semester I – Foundation in Design Thinking

SUBJECTS		CREDITS (30)						ASSESSMENT			
Course ID	Subject Name	S/P	L	T				Int	Ext	Exam	Total
MDES111	M. Des. Studio – I (Foundation Studio)	12	03			15		50	50	Jury	100
MDES112	Creativity, Ideation and Design Communication		01	03		04		50	50	Jury	100
MDES113	Basic Form Studies & Applied Ergonomics		02	02		04		50	50	Theory	100
MDES114	Design Studies, Materials and Manufacturing Process		02	02		04		50	50	Theory	100
MDES115	Elective I		02			03		100	-	Open	100

500

Semester II – Advanced Design Concepts

SUBJECTS		CREDITS (30)						ASSESSMENT			
Course ID	Subject Name	S/P	L	T				Int	Ext	Exam	Total
MDES121	M. Des. Studio – II (Advanced Design Studio)	12	03			15		50	50	Jury	100
MDES122	Design Thinking and Semantic Studies		03	01		04		50	50	Jury	100
MDES123	Advanced Form Studies & Human Centered Design		02	02		04		50	50	Theory	100
MDES124	Product Detailing and Sustainable Systems		03			04		50	50	Theory	100
MDES125	Elective II		02			03		100	-	Open	100

500

Semester III – Innovation and Iteration

SUBJECTS		CREDITS (30)						ASSESSMENT			
Course ID	Subject Name	S/P	L	T				Int	Ext	Exam	Total
MDES231	M. Des. Studio – III (Design Innovation Cell)	12	03			15		50	50	Jury	100
MDES232	Universal Human Values, Ethics & Environmental Psychology		03	01		04		50	50	Jury	100
MDES233	Design Prototyping and Iteration		02	02		04		50	50	Theory	100
MDES234	Industry Training		03			04		50	50	Viva	100
MDES235	Elective III		02			03		100	-	Open	100

500

Note: MDES234 – Industry Training will be for a period of 06 weeks at the end of Sem II and evaluated as a part of Sem III.

Semester IV – Design Thesis and Entrepreneurship

SUBJECTS		CREDITS (30)						ASSESSMENT			
Course ID	Subject Name	S/P	L	T				Int	Ext	Exam	Total
MDES241	M. Des. Studio – IV (Thesis)	21	03			24		60	40	Jury	100
MDES242	IPR, Professional Practice & Management		02	01		03		50	50	Theory	100
MDES243	Design Entrepreneurship & Business Strategies		02	01		03		50	50	Theory	100

300 Note: MDES241 – M.

Design Studio - IV (Thesis) will be showcased as a Design Exhibition at the end of the semester as a 'Design Capstone Exhibition'

S – Studio

L – Lecture

T – Tutorial

P/I – Practical (Lab)/ Internship

R – Research

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Consolidated Course Structure

Category/ Semester	Year I - Sem I	Year I - Sem II	Year II - Sem III	Year II - Sem IV
Design	M. Des. Studio – I (Foundation Design Studio)	M. Des. Studio – II (Advanced Design Studio)	M. Des. Studio – III (Design Innovation Cell)	M. Des. Studio – IV (Thesis)
Humanities & Form Studies	Basic Form Studies & Applied Ergonomics	Advanced Form Studies & Human Centered Design	Universal Human Values, Ethics & Environmental Psychology	Design Entrepreneurship & Business Strategies
Construction & Management Studies	Design Studies, Materials and Manufacturing Process	Product Detailing and Sustainable Systems	Industry Training	IPR, Professional Practice & Management
Technology & Innovation	Creativity, Ideation and Design Communication	Design Thinking and Semantic Studies	Design Prototyping and Iteration	

Semester I – Electives:

Course ID	Subject Name	Category	Credits	Assessment
MDES1151	Introduction to Cruise Ship Design	Mobility	03	100; Open Ended
MDES1152	Industrial design (Equipment for agriculture, medical, automobile, packaging, set design, etc.)	Manufacturing		
MDES1153	Art, Culture and Design	Socio-culture		
MDES1154	Interaction design (interiors, user experience, furniture & kitchen, interactive products, graphics, etc.)	Products		
MDES1155	Photography and Media	Multimedia		
MDES1156	Accessory design (jewellery & ceramics, bags, wallets, fashion items, etc.)	Arts and Crafts		
MDES1157	Open Elective			

Semester II – Electives:

Course ID	Subject Name	Category	Credits	Assessment
MDES1251	Cruise Ship Interior Design	Cruise	03	100; Open Ended
MDES1252	Design for Circular Economy	Social		
MDES1253	Ceramic and Glass Design	Culture		
MDES1254	Lighting and Fixtures Design	Services		
MDES1255	Film & Animation Media	Multimedia		
MDES1256	Open Elective			

Semester III – Electives:

Course ID	Subject Name	Category	Credits	Assessment
MDES1351	Cruise Ship Recreation & Experience Design	Cruise	03	100; Open Ended
MDES1352	Landscape and Signage Design	Social		
MDES1353	Handicraft & Textile Design	Culture		
MDES1354	Transport & Automobile Design	Services		
MDES1355	Interaction and Interface Design	Multimedia		

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester I: Foundation in Design Thinking

Learning Outcomes: Develop understanding of product design process, sustainable ergonomics, and user-centered design. Acquire knowledge of materials and manufacturing techniques, and apply sustainable design practices. Cultivate creativity, overcome blocks, and use creative tools for idea generation. Develop visual communication skills through sketching, rendering, and 3D modelling software.

MDES111 – M. Des. Studio – I (Foundation Studio)

- Product design process, need and methodology
- Sustainable Ergonomics and introduction to user-centered design
- Prototyping and testing techniques
- Design principles and aesthetics
- Design for everyday use
- Materials selection and manufacturing techniques

MDES112 – Creativity, Ideation and Design Communication

- Importance of creativity and ideation in design.
- Strategies for overcoming creative blocks and generating new ideas.
- Creative tools for idea generation and concept development.
- Inclusive design process and methods for diverse user groups.
- Sketching and rendering techniques
- Utilizing advanced software for 3D modelling and 2D rendering
- Integration of IT Lab*
- Integration of Research Lab*

MDES113 – Basic Form Studies and Applied Ergonomics

- Introduction to basic form studies and aesthetics.
- Significance of applied ergonomics in design.
- Ergonomic considerations in product design.
- Ergonomics in space planning and interior design.
- Techniques for ergonomic evaluation and analysis.
- Integration of form studies and applied ergonomics.

MDES114 - Design Studies, Materials and Manufacturing Processes

- Introduction to design thinking
- Design research methods, analysis, and user empathy.
- Evolution of design and its cultural/social impact through different eras.
- Introduction to design management principles
- Study of materials, manufacturing techniques and sustainability.
- Advanced digital fabrication techniques.
- Integration of Workshop/Carpentry Lab and Material Lab*

MDES115 – Elective I

- Elective Course: (Choose one based on student's interest)
 - a) MDES1151 - Introduction to Cruise Ship Design
 - b) MDES1152 - Universally Accessible Design
 - c) MDES1153 - Art, Culture and Design
 - d) MDES1154 - Acoustic and Sound Design
 - e) MDES1155 - Photography and Media

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester II: Advanced Design Concepts

Learning Outcomes: Cultivate students' proficiency in the total design process by engaging them in a project-based learning experience. Students will apply their acquired knowledge to deliver effective design solutions for specific problems. The outcomes foster critical thinking, problem-solving skills, and the ability to translate knowledge into practical design solutions in association with other theory and elective courses. Explore virtual reality and augmented reality applications.

MDES121 – M. Des. Studio – II (Advanced Design Studio)

- Apply total design process to solve complex problems.
- Deliver effective design solutions by synthesizing knowledge acquired
- Formulate comprehensive design briefs that address identified problems.
- Evaluate and select the most promising design concepts based on defined criteria.
- Validate the design solution through testing and user feedback.

MDES122 – Design Thinking and Semantic Studies

- Introduction to Design Thinking and Social Innovation.
- Ideation and Creative Problem-Solving.
- Design Sprint Methodologies and Considerations.
- Design Thinking in Practice, Mindset and Reflection.
- Design narratives that effectively convey messages
- User Experience (UX) and User Interface (UI) design
- Integration of IT Lab
- Integration of Research Lab

MDES123 – Advanced Form Studies and Human Centered Design

- Explore innovative and unconventional design forms.
- Human – Centred Design & design for need
- Design for diverse user groups and accessibility.
- Product function and architecture
- Prioritize user needs, pattern, behaviours, and comfort.
- Create engaging and intuitive user experiences.

MDES124 – Product Detailing and Sustainable Systems

- Understanding different materials and components used
- Engineering and Manufacturing Considerations
- Exploring various finishing techniques and surface treatments
- Design for Manufacturing and Assembly
- Examining sustainable design principles and practices
- Analysing certifications and standards
- Integration of Material Lab

MDES125 – Elective II

- Elective Course: (Choose one based on student's interest)
 - a) MDES1251 - Cruise Ship Interior Design
 - b) MDES1252 – Design for Circular Economy
 - c) MDES1253 - Ceramic and Glass Design
 - d) MDES1254 - Lighting and Fixtures Design

Masters in Design Program (M. Des.)

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Semester III: Innovation and Iteration

Learning Outcomes: Students will develop innovative thinking skills and understand the role of design in entrepreneurship and innovation. They will gain knowledge and practical experience in intellectual property rights and patenting, preparing them for patentable design ideas and research-based projects.

MDES231 – M. Des. Studio – III (Design Innovation Cell)

- Researching passenger needs and preferences for informed design.
- Generating innovative ideas for ship layout, cabins, amenities, and entertainment.
- Considering sustainability and environmental factors in design.
- Utilizing technologies like virtual reality, augmented reality, IoT and AI for onboard experiences.
- Designing inclusively for passengers with disabilities or special needs.
- Collaborating on immersive entertainment experiences, interactive installations, and wellness-focused amenities.

MDES232 – Universal Human Values, Ethics & Environmental Psychology

- Introduction to universal human values and their significance.
- Major ethical theories and decision-making frameworks.
- Psychological impact of environments: environmental psychology.
- Social justice, equality, and ethical dimensions.
- Professional ethics in various fields.
- Values, ethics, and sustainability.
- Integration of Research Lab

MDES233 – Design Prototyping and Iteration

- Methods for prototyping- 3D modelling, paper prototyping, and rapid prototyping.
- Range of materials and tools for prototyping.
- Iterative approach - creating multiple versions and gathering feedback.
- Incorporating stakeholder and user feedback into the design process.
- Driving iterative improvements through design reviews.
- Collaborative sessions in the design process.
- Agile design principles.
- Integration of IT Lab*

MDES234 - Industry Internship and Networking

- 06-week internship in a design firm or relevant industry
- Exposure to real-world projects and professional environments
- Networking opportunities with industry experts and practitioners
- During Summer Vacation after Sem II & before Sem III

MDES235 – Elective III

- Elective Course: (Choose one based on student's interest)
 - a) MDES2351 - Cruise Ship Recreation and Experience Design
 - b) MDES2352 - Landscape and Signage Design
 - c) MDES2353 - Handicraft & Textile Design
 - d) MDES2354 – Transport & Automobile Design
 - e) MDES2355 - Interaction and Interface Design

Masters in Design Program (M. Des.)

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Semester IV: Design Thesis and Entrepreneurship

Learning Outcomes: Students will gain practical experience in project management and professional practice. They will apply their knowledge and skills to an advanced design project with a focus on patentable ideas. The thesis and patent application will showcase their ability to contribute to the field of design through innovation and intellectual property protection.

MDES241 – M. Des. Studio IV – Thesis

- Independent research and design project
- Development of a patentable design solution
- Written thesis and patent application preparation
- Integration of Research Lab

MDES242 – Intellectual Property Rights, Professional Practice & Management

- Introduction to Intellectual Property Rights
- Acts, Regulations and Laws
- Copyright and Design Protection
- Trademarks and Brand Protection
- Patents and Design Innovation
- Professional Practice and Management

MDES243- Design Entrepreneurship and Business Strategies

- Introduction to Design Entrepreneurship and its importance in business.
- Business strategies for design ventures.
- Funding and financing options for design start-ups.
- Applying design thinking in business and innovation.
- Branding, marketing, and growth strategies for design entrepreneurs.

Note: MDES241 – M. Design Studio - IV (Thesis) will be showcased as a Design Exhibition at the end of the semester as a 'Design Capstone Exhibition'

Detailed Syllabus for Master of Design

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada
Semester I: Foundation Design Studio – I

I Year I Sem

MDES111 – Foundation Studio

15 Credits

Module I: Product Analysis and Improvement:

Choose a product and conduct a comprehensive critique focusing on:

- Design for everyday use (at home, streets, schools, universities, markets, etc.)
- Design principles (universal design, discoverability, signifiers, user-centered design, interactive, etc.)
- Sustainable ergonomics (age-group specific design – Kids, Teens, Adult, Elderly)
- Materials selection & manufacturing techniques (light weight, durable, tolerance for error)
- Product design process & methodology (human-centered iterative design or DD process, etc.)
- Prototyping and testing (Iterative design process)

The course will critique various products, taking into account Indian contextual use and possible functions. Generate 5-10 design concepts aimed at addressing the identified weaknesses and enhancing strengths for improved quality and functionality of the product. Provide a detailed justification for each conceptual solution, explaining how it resolves the identified problems or weakness and enhances the product's value by strengthening the opportunities. Develop one of the proposed concepts into a refined product design, incorporating feedback and iterative improvements based on user-centricity and design principles in the design studio.

Module II:

Smart City Solutions – Urban Mobility (Land-Air-Water), Smart Home Energy Monitoring/ Control Systems

- Survey & analyze the urban built environment to identify challenges faced by selected residents (user-centered) with a focus on prevalent issues, such as mobility, energy shortage, safety walkability, and accessibility to community or household essentials including parks and markets.
- Propose sustainable solutions to address these challenges, considering the limitations of available resources, challenges, and the long-term impact on the community and environment. (Eg. Pvt. or rental electric cycles, drones, kickboards, smartphone apps to monitor energy, etc.)
- Present the solutions in a compelling manner, emphasizing their feasibility, scalability, and potential to enhance the overall quality of life in the city.

Module III:

Tour of Rural Community Enhancement – Accessibility to Comfort & Convenience

- Lifestyle survey: Gain insight into the daily lives of rural residents, understanding their routines, challenges, and priorities.
- Identify key activities and elements that significantly affect their livelihoods and well-being.
- Propose value-added solutions to streamline daily tasks, improve efficiency, and enhance overall quality of life for rural communities.
- Explore opportunities for innovation and community development, leveraging local resources and cultural practices to create sustainable solutions tailored to the needs of the rural population.
- Educational study trip: Cultural heritage village, rural arts and crafts centers, eco-tourism, etc., to get a first-hand experience of rural traditional crafts like bamboo weaving, pottery, handloom, textile manufacturing etc.

Module IV:

8-10 hours' Time Problem - Future Product Design (Imagine its future)

- The basic idea of this problem is to be able to apply the syllabus mandated study areas including: universal design principles, everyday use products, ergonomics, materials and manufacturing, design process and methods, prototyping and testing (qualitative);
- Select a contemporary product and conduct user research to understand its current usage patterns and user demographics.
- Generate innovative design concepts envisioning the future of the product, considering technological advancements, societal trends, and user preferences. (Eg. Pen, Knife, TV, Cycle, etc.)
- Articulate the concepts and present in a compelling manner, highlighting their potential to meet evolving user needs, enhance user experiences, and contribute to future lifestyles and environments.

Essential Reading:

- Norman, D. A. (2013). The design of everyday things. MIT Press.
- Norman DA. Emotional Design: Why We Love (or Hate) Everyday Things. Basic Books; 2004.
- Papanek VJ. Design for the Real World. Third edition. Paperback edition. Thames and Hudson; 2019.
- Aspelund K. The Design Process. Fourth edition. Fairchild Books; 2022.
- Bill M, Castiglioni A, Danese B, et al. Design since 1945, Philadelphia Museum of Art; 1983.
- MacLean KJM. A Geometric Analysis of the Platonic Solids and Other Semi-Regular Polyhedra with an Introduction to the Phi Ratio: For Teachers, Researchers, and the Generally Curious. Second edition (with additional material). Big Picture; 2020.
- Bayer, H., Gropius, W., Gropius, I. Bauhaus 1925-1928. MoMA, New York, 1938.
- John Chris Jones, **Design Methods: Seeds of Human Futures**, Wiley.

Supplementary Reading/ Design Journals:

1. Papanek VJ. Design for the Real World. Third edition. Paperback edition. Thames and Hudson; 2019.
2. MacGregor N, British Museum, BBC Radio 4. A History of the World in 100 Objects. First American edition. Viking; 2011.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada
Semester I: Foundation in Design Thinking

Year I Sem I

MDES112 – Creativity, Ideation & Design Communication

04 Credits

Unit 1: Creativity, Ideation and Inclusivity

- Introduction to creativity and its significance in design
- Exploring the role of ideation in generating innovative solutions
- Case studies highlighting the impact of creativity and ideation in successful designs
- Understanding the principles of inclusive design
- Conducting user research and empathy mapping for diverse user groups
- Applying inclusive design methods to create products and services that cater to different user needs

Unit 2: Creative blocks and risks in ideation

- Identifying common creative blocks and barriers
- Techniques for overcoming creative blocks, such as brainstorming, mind mapping, and lateral thinking
- Developing a creative mindset and fostering a conducive environment for ideation
- Promoting a culture of experimentation and risk-taking in design
- Embracing failure as a learning opportunity
- Strategies for fostering a mindset of innovation and embracing unconventional ideas

Unit 3: Creative Tools for Idea Generation

- Introduction to various creative tools and techniques
- Hands-on exercises using tools like SCAMPER, Six Thinking Hats, and Design Fiction
- Applying ideation techniques to develop and refine design concepts
- Developing freehand sketching skills for visual communication
- Techniques for shading, perspective, and rendering to bring designs to life
- Applying sketching as a tool for ideation and concept visualization

Unit 4: Advanced software for 2D rendering and 3D modelling

- Introduction to industry-standard software for 3D modelling and rendering
- Creating digital models and visualizations of design concepts
- Exploring lighting, texturing, and rendering techniques for realistic representations
- Applying rendering techniques to create realistic visualizations of interior spaces and product designs
- Exploring materials, lighting, and atmospheric effects for enhancing visual impact

Unit 5: Presentation Techniques

- Developing persuasive presentation skills for design proposals
- Creating professional design portfolios and documentation
- Engaging stakeholders through effective visual communication techniques
- Integration of IT Lab for learning software tools and applications

Essential Reading:

- Robert A. Curedale. 50 Brainstorming Methods: For team and individual ideation, Design community college Inc., 2013
- Rich Gold, The Plenitude: Creativity, Innovation, and Making Stuff, The MIT Press, 2007.
- Leski, K. The Storm of Creativity, The MIT Press, 2015.
- Indi Young. Practical Empathy: For Collaboration and Creativity in Your Work 1st Edition, Rosenfeld Media, 2015.
- Coen Luijten. Creativity Works : Unleash your Creativity, Beat the Robot and Work Happily Ever After, BIS, 2018.
- Tom Kelley. The Art Of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm, Profile books, 2016.
- Meredith Davis, Jamer Hunt. Visual Communication Design: An Introduction to Design Concepts in Everyday Experience, Bloomsbury Publishing, 2017.
- Gavin Ambrose. Design Thinking for Visual communication, Bloomsbury Publishing, 2015.

Supplementary Reading/ Design Journals:

- John Twyford. Graphic Communication, Batsford Ltd., 1981
- Edward R. Tufte. The Visual Display of Quantitative Information, Graphics Press, 2001
- Peter Zec. International Yearbook Communication Design, Red dot editions, 2018.
- Edward Gottschall. Typographic Communications Today, The MIT Press, 1989.
- Kate Nash. Interactive Documentary, Theory and Debate. Routledge, London, 2021.
- Journals, Papers, and reference materials as per topics & instructor.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester I: Foundation in Design Thinking

Year I Sem I

MDES113 – Basic Form Studies and Applied Ergonomics

04 Credits

Unit 1: Fundamental design principles and elements

- Introduction to design principles like balance, proportion, rhythm, and harmony
- Exploring the use of lines, shapes, colours, and textures in design
- Analysing the impact of design elements on user experience

Unit 2: Human anthropometry

- Understanding human body dimensions and proportions
- Anthropometric data collection and analysis
- Applying anthropometric principles to design products and spaces that cater to human needs

Unit 3: Ergonomic studies

- Integrating ergonomic considerations in the design process
- Ideation techniques for generating ergonomic solutions
- Applying ergonomic principles to improve user comfort, safety, and efficiency

Unit 4: Ergonomics qualities

- Exploring ergonomic qualities like adjustability, accessibility, and usability
- Case studies highlighting the importance of ergonomic design in various industries
- Evaluating and improving the ergonomic qualities of existing designs

Unit 5: Lab Studies

- Hands-on experience with woodworking tools and equipment
- Experimentation with different materials and their properties
- Understanding construction techniques and detailing for translating design concepts into physical prototypes

Essential Reading:

- Wong Wucius. Principles of form and design. John Wiley & Sons Inc., 1993.
- Francis D.K. Ching, Architecture Form Space and Order, 3rd Edition, Wiley
- Mark S. Sanders, & Ernest J. McCormick, Human factors in Engineering & Design, McGraw-Hill, Inc
- Alvin R. Tilley, Henry Dreyfuss Associates: The Measure of Man and Woman: Human Factors in Design, Revised Edition
- Bridger, RS: Introduction to Ergonomics, 2nd Edition, Taylor & Francis, 2003.
- E. Grandjean, Fitting the task to the man, Taylor and Francis, 1963.
- W.E. Woodson, Human Factor Design Handbook, McGraw Hill, New York, 1981
- Ken Parsons, Human thermal environment, 2nd Edi., Taylor and Francis, 2003
- Debkumar Chakrabarti, Indian Anthropometric Dimensions (For Ergonomic Design Practice
- Journals, Papers, and reference materials as per topics & instructor

Supplementary Reading:

- Lidwell, W., Holden, K., Butler, J. Universal Principles of Design, revised and updated. Rockport publishers, 2010.

- Bayer, H., Gropius, W., Gropius, I. Bauhaus 1925-1928. MoMA, New York, 1938.
- Neufert's, Architect's Data, Blackwell Publishers
- Dormer, Peter, Design Since 1945 (World of Art). Thames & Hudson, 1993.
- Norman, D. Emotional Design - Why we love or (hate) everyday things. Basic Books, New York, 2004.
- Norman, D. The Design of Everyday Things, Revised and Expanded Edition. Basic Books, New York, 2013.
- Wong Wucius. Principles of Color Design. John Wiley & Sons Inc., New York, 1986.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada Semester I: Foundation in Design Thinking

Year I Sem I

MDES114 - Design Studies, Material & Manufacturing Processes

04 Credits

Unit 1: Evolution and Impact of Design

- Studying the historical development of design from ancient civilizations to modern times
- Analysing design movements and their influence on contemporary design practices
- Exploring the cultural and societal factors that shape design trends
- Exploring the role of design in shaping culture, society, and identity
- Analysing the ethical and sustainable implications of design decisions
- Investigating the relationship between design, technology, and globalization

Unit 2: Introduction to design thinking and management principles

- Understanding the principles and process of design thinking
- Applying human-centered design methodologies to solve complex problems
- Case studies showcasing successful applications of design thinking in various domains
- Understanding the fundamentals of design management
- Exploring project management techniques for design projects
- Examining the role of design managers in coordinating multidisciplinary teams

Unit 3: Study of materials and their properties

- Introduction to different materials used in design, such as metals, polymers, ceramics, and composites
- Understanding material properties, including strength, durability, and aesthetics
- Material selection criteria for specific design applications

Unit 4: Construction & Manufacturing techniques and processes

- Overview of various manufacturing processes, including casting, moulding, machining, and additive manufacturing
- Exploring the advantages and limitations of different manufacturing methods
- Understanding the impact of manufacturing processes on design feasibility and quality
- Understanding construction techniques for building functional prototypes and final products
- Exploring joints, connections, and assembly methods for different materials

Unit 5: Advanced Digital Fabrication Techniques

- Introduction to advanced digital fabrication technologies like CNC machining, laser cutting, and 3D printing
- Hands-on experience with digital fabrication tools and equipment
- Exploring the integration of digital fabrication in the design process
- Integration of Workshop/Carpentry Lab and Material Lab for practical application of materials and manufacturing processes

Essential Reading:

- Clark, H. and Brody, D. eds. (2010) Design Studies: A reader, New York: Berg.
- John Chris Jones, Design Methods: Seeds of Human Futures, Wiley.
- Cross, Nigel. (1993). A history of design methodology.
- Ben Highmore. The Design Culture Reader, Routledge, London, 2008.
- Elvin Karana, Owain Pedgley and Valentina Rognoli. Materials Experience, Elsevier Ltd., 2014.
- Tim Brown. "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation".

- Paul Wahl. Designing Regenerative Cultures, Triarchy Press, 2016.
- Gerard Goggin. Cell phone culture: Mobile technology in everyday life, Routledge, 2006.
- Armstrong & McDowell. Fashioning Professionals: Identity and Representation at Work in the Creative Industries, Bloomsbury, 2018.
- Thomas Lockwood. Design Thinking, Allworth, 2010.
- Wallschlaeger, Cynthia Snyder. Basic Visual Concepts and Principles for Artists, Architects and Designers, Wm. C. Brown Publishers, 1992.
- Norman, D. The Design of Everyday Things, Basic Books, New York, 2013.
- Ashby. Ashby. Materials and the environment: Eco-informed materials choice, Butterworth-Heinemann, 2009.
- Rob Thomson. Sustainable materials, processes and production, Thames & Hudson, 2013.
- Rob Thomson. Manufacturing processes for design professionals, Thames & Hudson, 2007.
- Lucy Johnston. Digital Handmade, W Norton, 2015.
- Paul Kunkel. Digital Dreams, Universe Pub., 1999.
- Ann Marie Shillito. Digital Crafts, Bloomsbury Visual Arts, 2013.
- Journals, Papers, and reference materials as per topics & instructor

Supplementary Reading/ Design Journals:

- Clarke, Alison J. (2011) Design Anthropology. Vienna: Springer
- Heskett, J., (2002) Design: A very short Introduction, Oxford: Oxford University Press
- Julier G. (2013) The Culture of Design, London: Sage
- Papanek, Victor (2000) Design for the Real World: Human Ecology and Social Change
- Christopher Alexander. The Timeless Way of Building. Center for environmental structure, Oxford Univ. Press, 1979.
- Michael Lewrick, Patrick Link, and Larry Leifer. "The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems".
- Elizabeth Goodman, Mike Kuniavsky, and Andrea Moed. "Observing the User Experience: A Practitioner's Guide to User Research"
- Brenda Laurel. "Design Research: Methods and Perspectives".
- Bella Martin and Bruce Hanington. "Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions".
- Rex Hartson and Pardha Pyla. "The UX Book: Process and Guidelines for Ensuring a Quality User Experience."
- Jim Kalbach. "Mapping Experiences: A Complete Guide to Creating Value through Journeys, Blueprints, and Diagrams".
- Alistair Croll and Benjamin Yoskovitz. "Lean Analytics: Use Data to Build a Better Startup Faster"
- Indi Young. "Practical Empathy: For Collaboration and Creativity in Your Work".
- Roman Krznaric. "Empathy: Why It Matters, and How to Get It"
- Paul Boag. "User Experience Revolution: A Practical Guide to Developing and Executing a Successful UX Strategy".

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester I: Foundation in Design Thinking

Year I Sem I

MDES1115 – Elective - I

03 Credits

a) Cruise Ship Design

- Design challenges and considerations specific to cruise ships.
- Layout and organization of cabins, public areas, and recreational facilities.
- Basic interior design principles for cruise ships.
- Safety regulations and standards in cruise ship design.
- Environmental sustainability in cruise ship design.

b) Industrial Design

- Principles of inclusive design for people with disabilities.
- Specific requirements for mobility, sensory perception, and cognitive abilities.
- Case studies and examples of accessible design.
- Strategies and solutions for creating inclusive spaces, products, and interfaces.
- Importance of user research and empathy in inclusive design.

c) Art, Culture, and Design

- Influence of culture on design aesthetics and meanings.
- Exploration of different cultural influences on design styles.
- Role of design in preserving and promoting cultural heritage.
- Ethical considerations in cultural appropriation.
- Case studies highlighting the intersection of art, culture, and design.

d) Interaction Design

- Introduction to UXD, User experience design
- UXD Design methods, process, and tools
- Ideation in design, Design thinking process
- Human factors -psychology, physiology in interaction design
- Affordances: Designing Intuitive User Interfaces
- Use-centered design, Human-centered design
- Prototype development, Usability testing

e) Photography and Media

- Fundamentals of photography, including composition and lighting.
- Using photography for visual storytelling in design.
- Different genres of photography.
- Hands-on experience with cameras and editing software.
- Incorporating photography in design portfolios and presentations.

Essential Reading:

- Philip S. Dawson. Cruise Ships: An Evolution in Design. Conway Maritime, 2000.

- Chris Frame, Rachelle Cross. The Evolution of the Passenger Ship. The History Press, August, 2024.
- Buzova, D. Cruise Ships and Sustainability. In: The Palgrave Handbook of Global Sustainability. Palgrave Macmillan, Cham, 2022.
- Lewis E.U; Principles of Naval Architecture (2nd Revision) Vol. III 1989; SNAME, New York
- D J Eyres and G J Bruce; Ship Construction, Butterworth Heinemann, 2012.
- Charlotte Fiell. Industrial Design A-Z, Taschen, 2016
- John Heskett. Industrial design, Oxford University Press, 1980
- Walther Scheidig. Crafts of the Weimar Bauhaus, 1919-1924: an early experiment in industrial design, Reinhold, 1967.
- Reigeluth, Charles M.; Instructional-Design Theories and Models: A New Paradigm of Instructional Theory (Instructional Design Theories & Models); Lea, 1999.
- Cooper, Alan; Reimann, Robert; About Face 2.0 the Essentials of Interaction Design; Wiley, 2003
- Norman, D. The Design of Everyday Things, Revised and Expanded Edition. Basic Books, New York, 2013.
- Goodman & Kuniavsky. Observing the User Experience: A Practitioner's Guide to User Research, Morgan Kaufmann, 2012.
- Bill Buxton. Sketching User Experiences: Getting the Design Right and the Right Design Book, Morgan Kaufmann, 2007.
- Jeffrey Rubin. Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests, John Wiley & Sons, 2011.
- Peter Quartermaine. Cruise: Identity, Design and Culture. Rizzoli International Publications, 2006.
- Daniel Christian. Designing Regenerative Cultures, Triarchy Press Ltd., 2016.
- Gerard Goggin. Cell Phone Culture: Mobile technology in everyday life. Routledge, 2006.
- Fallan, K. The Culture and Nature in the History of Design. Routledge, 2019.
- London, B & Stone, J. A Short Course in Digital Photography, Pearson Education, Prentice Hall, 2012.
- Kelsey & Stimson. Clark Studies in Visual Arts, The Meaning of Photography, Yale Univ. Press.
- Agfa. 1994. An Introduction to Digital Photo Imaging. Agfa Publisher
- Agfa. 1994. An Introduction to Digital Scanning. Agfa Publisher

Supplementary Reading/ Journals:

- Ships and Offshore Structures. Francis & Taylor, Online.
- Pacific Science Review. Elsevier Journal.
- Energy Conversion and Management. Elsevier Journal.
- Journals, Papers, and reference materials as per topics & instructor.
- Tristan Perez; Ship Motion Control, Course Keeping and Roll Stabilization Using Rudder and Fins, 2005; Springer.
- Anthony F. Molland and Stephen R. Turnock; Marine Rudders and Control Surfaces - Principles, Data, Design and Applications, 2007; Butterworth-Heinemann

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester II: Advanced Design Concepts

II Year II Sem

MDES121 – M. Des. Studio – II (Advanced Design Concepts)

15 Credits

Objectives/Learning Outcomes: Cultivate students' proficiency in the total design process by engaging them in a project-based learning experience. Students will apply their acquired knowledge to deliver effective design solutions for specific problems. The outcomes foster critical thinking, problem-solving skills, and the ability to translate knowledge into practical design solutions in association with other theory and elective courses. Explore virtual reality and augmented reality applications.

- Apply total design process to solve complex problems.
- Deliver effective design solutions by synthesizing knowledge acquired
- Formulate comprehensive design briefs that address identified problems.
- Evaluate and select the most promising design concepts based on defined criteria.
- Validate the design solution through testing and user feedback.

Module I: User/Design Research – Search, discover

Apply total design process to solve complex problems: Surveys and Questionnaires: Collecting qualitative and quantitative data on base design cases, passenger preferences, habits, and satisfaction levels, etc.

Module II: Design Synthesis - Define insights, keywords, generate key ideas

Deliver effective design solutions by synthesizing knowledge acquired: Analyzing survey data to identify trends and significant patterns. Examining qualitative and quantitative and synthesize them to define insights and generate key design ideas, and form keywords.

Module III: Design Development - Develop ideas, ideation, brainstorm

Formulate comprehensive design solutions and briefs that address identified problems: This is design development stage where solutions are define, ideated, brainstorm, and developed into possible solutions. It also involves design or idea evaluation and selection of the most promising design concepts based on defined criteria.

Module IV: Design Prototyping & Testing - Implement, select, deliver

Validate the design solution through testing and user feedback: Selected design ideas and solutions are to be developed into modules and prototypes. These prototypes are to be tested with relevant methods, such as human-centered design iterative processes, parametric simulations, etc., using appropriate design tools and software.

Essential Reading

- "Design Thinking" by Peter G. Rowe
- "The Design of Everyday Things" by Don Norman
- "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation" by Tim Brown
- "Sketching User Experiences: The Workbook" by Bill Buxton
- "Thinking with Type: A Critical Guide for Designers, Writers, Editors, & Students" by Ellen Lupton

- "Graphic Design: The New Basics" by Ellen Lupton and Jennifer Cole Phillips
- "The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm" by Kelley & Littman
- "Designing Interactions" by Bill Moggridge
- "Make It New: The History of Silicon Valley Design" by Barry M. Katz
- "The Design of Everyday Things" by Don Norman
- "Engineering Design: A Systematic Approach" by Gerhard Pahl and Wolfgang Beitz
- "Universal Principles of Design" by William Lidwell, Kritina Holden, and Jill Butler
- "Designing for the Digital Age: How to Create Human-Centered Products and Services" by Kim Goodwin
- "Product Design and Development" by Karl T. Ulrich and Steven D. Eppinger

Supplementary Reading/Design Journals:

- Journals/other relevant reading materials as per instructors/coordinators.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester II: Advanced Design Concepts

Year I Sem II

MDES122 – Design Thinking & Semantic Studies

04 Credits

Unit 1: Introduction to Design Thinking and Social Innovation

- Overview of design thinking principles and process
- Understanding the role of design thinking in social innovation
- Exploring case studies of successful design thinking projects in social contexts

Unit 2: Creative Problem-Solving, Communication and Cognition

- Techniques for generating and selecting innovative ideas
- Tools for creative problem-solving within design thinking
- Understanding the cognitive processes involved in design communication
- Applying cognitive psychology principles to enhance design effectiveness
- Strategies for designing with cognitive biases and mental models in mind

Unit 3: Interpreting Semiotics in Design

- Understanding semiotics and its relevance to design
- Analysing the cultural context and its impact on design elements and narratives
- Examining the role of cultural references and symbolism in design communication

Unit 4: Design Thinking and Narratives

- Developing a design thinking mindset and fostering a culture of innovation
- Reflection on the design thinking process and its impact on social innovation
- Principles of storytelling in design
- Creating compelling narratives through visual and interactive elements
- Techniques for designing coherent and engaging design narratives

Unit 5: User Experience (UX) and User Interface (UI) Design

- Introduction to user experience (UX) design principles and processes
- Designing intuitive and user-centred user interfaces (UI)
- Usability testing and iteration for enhancing user experience

Essential Readings:

1. "Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation" by Tim Brown
2. "Designing for Social Change: Strategies for Community-Based Graphic Design" by Andrew Shea
3. "The Field Guide to Human-Centered Design" by IDEO.org
4. "Creative Confidence: Unleashing the Creative Potential Within Us All" by Tom Kelley and David Kelley
5. "Thinkertoys: A Handbook of Creative-Thinking Techniques" by Michael Michalko

6. "The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators" by Jeff Dyer, Hal Gregersen, and Clayton M. Christensen
7. "Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days" by Jake Knapp, John Zeratsky, and Braden Kowitz
8. "Design Sprint: A Practical Guidebook for Building Great Digital Products" by Richard Banfield, C. Todd Lombardo, and Trace Wax
9. Umberto Eco: A Theory of Semiotics, Indiana University Press, 1979.
10. "The Design of Business: Why Design Thinking is the Next Competitive Advantage" by Roger L. Martin
11. "This is Service Design Thinking: Basics, Tools, Cases" by Marc Stickdorn and Jakob Schneider
12. "Design Thinking for Strategic Innovation: What They Can't Teach You at Business or Design School" by Idris Mootee
13. "Storytelling for User Experience: Crafting Stories for Better Design" by Whitney Quesenbery and Kevin Brooks
14. "Made to Stick: Why Some Ideas Survive and Others Die" by Chip Heath and Dan Heath
15. "Don't Make Me Think, Revisited: A Common-Sense Approach to Web Usability" by Steve Krug
16. "The Elements of User Experience: User-Centered Design for the Web and Beyond" by Jesse James Garrett
17. "About Face: The Essentials of Interaction Design" by Alan Cooper, Robert Reimann, David Cronin, and Christopher Noessel
18. Ben Shneiderman, Catherine Plaisant. Designing the User Interface: Strategies for Effective Human-computer Interaction, Pearson/Addison Wesley, 2005.
19. Journals/Reading materials as per instructors/coordinators.

Supplementary Readings/Journals:

1. Journals/other relevant reading materials as per instructors/coordinators.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester II: Advanced Design Concepts

Year I Sem II

MDES123 – Advanced Form Studies & Human Centered Design (2T+ 1L) 04 Credits

Unit 1: Innovative and Unconventional Design Forms

- Introduction to innovative and unconventional design forms
- Examples of cutting-edge design trends and concepts
- Exploring the intersection of aesthetics and functionality in design

Unit 2: User Groups and Accessibility

- Understanding the importance of inclusivity and accessibility in design
- User-centered design for diverse populations
- Strategies and considerations for designing inclusive products and experiences

Unit 3: Ergonomics and User Interaction

- Principles of ergonomics and its impact on product design
- Human factors and user-centered design considerations
- Designing for comfortable and efficient user interaction

Unit 4: Prioritizing Needs, Patterns, Behaviours, and Comfort

- User research and needs assessment methods
- Analysing user patterns, behaviours, and preferences
- Designing for user comfort and ergonomics

Unit 5: Intuitive User Experiences

- Principles of user experience (UX) design
- Techniques for creating engaging and intuitive interfaces
- Usability testing and iterative design processes for enhancing user experience

Essential Readings:

1. Lidwell W, Holden K, Butler J. Universal Principles of Design. Rockport Publishers.
2. Pye D. The Nature and Art of Workmanship. Revised edition. (Shales E, ed.). Bloomsbury Visual Arts; 2020.
3. Elam K. Geometry of Design: Studies in Proportion and Composition. 2nd ed., rev. and updated. Princeton Architectural Press; 2011

Supplementary Readings:

1. Heskett J. Design: A Very Short Introduction. Oxford University Press; 2005.
2. Proctor R. 1000 Eco Design. Logos; 2009.

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Semester II: Advanced Design Concepts

Year I Sem II

MDES124 – Product Detailing and Sustainable Systems

04 Credits

Unit 1: Material and Component Study

- Understanding Different Materials and Components Used
- Overview of common materials used in design and manufacturing
- Properties and characteristics of different materials
- Understanding the role of components in product design and assembly
- Different types of finishing techniques for enhancing product aesthetics
- Surface treatment methods for improving durability and functionality

Unit 2: Engineering and Manufacturing in Design

- Principles of engineering design and manufacturing processes
- Design for manufacturability and assembly (DFMA) guidelines
- Cost considerations and optimization in engineering and manufacturing
- Strategies for designing products that are easy to manufacture and assemble
- Design guidelines for minimizing production costs and lead times

Unit 3: Product Function and Architecture

- Understanding the relationship between product function and design
- Principles of designing functional and efficient product architecture
- Balancing form and function in design decision-making

Unit 4: Sustainable Design Principles and Practices

- Introduction to sustainable design principles and their importance
- Understanding the environmental, social, and economic impacts of design
- Exploring sustainable design strategies and best practices
- Strategies for minimizing environmental footprint in design projects
- Considerations for energy efficiency and waste reduction in design

Unit 5: Disaster Management Strategies & Design

- Understanding the role of design in disaster management and resilience
- Design considerations for mitigating and responding to natural disasters
- Case studies and examples of design solutions for disaster management

Essential Reading:

- Elvin Karana, Owain Pedgley and Valentina Rognoli. Materials Experience, Elsevier Ltd., 2014.
- Christopher Alexander. Notes on the Synthesis of Form. Harvard University Press, 1964.
- John Chris Jones, Design Methods: Seeds of Human Futures, Wiley.
- Cross, Nigel. (1993). A history of design methodology.
- Don Norman, The Design of Everyday Things. Basic Books, New York, 2013.
- William Lidwell. Deconstructing product design. Rockport publishers, 2009.
- Stuart Walker. The handbook of Design for Sustainability. A & C Black, 2013.
- Kent E. Portney. Sustainability. The MIT Press, 2015
- Crul & Diehl. _Design for Sustainability: A Step-by-Step Approach, UNEP, 2009.
- Otto & Troni. A Practical Guide to Climate-resilient Buildings & Communities. UNEP, 2021.
- Heskett, J., (2002) Design: A very short Introduction, Oxford: Oxford University Press
- Julier G. (2013) The Culture of Design, London: Sage
- Julier G. (2017) The Economy of Design, London: Sage
- Papanek, Victor (2000) Design for the Real World: Human Ecology and Social Change
- Boradkar, Prasad (2010) Designing Things: A Critical Introduction to the Culture of Objects, New York: Berg.
- Clark, H. and Brody, D. eds. (2010) Design Studies: A reader, New York: Berg.
- Journals, Papers, and reference materials as per topics & instructor

Supplementary Reading/ Design Journals:

- Ezio Manzini and Carlo Vezzoli, Product-Service Systems and Sustainability. Taylor & Francis Group, London, 2014.
- Design Issues, MIT Press
- Design and Culture, Taylor & Francis, The Design Journal, Taylor & Francis

- Design Studies, Elsevier

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Semester II: Advanced Design Concepts

Year I Sem II

MDES1125 – Elective - II

03 Credits

a) Cruise Ship Interior Design

- Space planning and optimization for efficient flow.
- Compliance with safety and regulatory standards.
- Creating immersive theming and aesthetics.
- Designing comfortable and functional cabins.
- Captivating public areas and entertainment spaces.

b) Design for Circular Economy

- Emphasizing reduce, reuse, and recycle principles.
- Designing products and systems for resource efficiency.
- Using sustainable materials and manufacturing processes.
- Exploring innovative business models for sustainability.
- Considering lifecycle from extraction to disposal.

c) Ceramic and Glass Design

- Material exploration and experimentation.
- Balancing form and function.
- Surface treatments and finishes for visual appeal.
- Incorporating colour and pattern.
- Emphasizing sustainability and kiln technology.

d) Lighting and Fixtures Design

- Understanding lighting design principles.
- Focus on energy efficiency and sustainability.
- Custom fixture design for unique aesthetics.
- Human-centric lighting considerations.
- Outdoor and landscape lighting techniques.

e) Film & Animation Media

- Crafting compelling storytelling and narratives.
- Attention to visual design and aesthetics.
- Mastering animation techniques and software.
- Sound design and music integration.
- Post-production and editing for a polished final product.

Essential Reading:

- Norman Friedman (2012)., 'Marine Structural Design', Butterworth-Heinemann., 2nd Edition.
- Philip S. Dawson. Cruise Ships: An Evolution in Design. Conway Maritime, 2000.

- Chris Frame, Rachelle Cross. The Evolution of the Passenger Ship. The History Press, August, 2024.
- Loyens, D., Chakraborty, S., Pimenta, D. (2023). Product Design for the Circular Economy: A Design Process for Footwear. DOI: https://doi.org/10.1007/978-3-031-33890-8_13
- Lerwen Liu, Seeram Ramakrishna. Designing for the Circular Economy. Springer Nature, 2020
- Charter, Martin (2018). 'Designing for the Circular Economy'. Routledge.
- T. Kono, L. Lynn. Strategic New Product Development for the Global Economy. Springer, 2007
- Vanessa Cutler. New Technologies in Glass, A & B Black, 2012
- Sudha Pillai (2003)., 'Ceramics: A Potter's Handbook', Bharatiya Kala Prakashan.
- Neil MacMillan (2020)., 'Ceramics: Art and Perception', Bloomsbury Publishing.
- Shackelford & Doremus. Ceramic and Glass Materials Structure, Properties and Processing. Springer, 2008
- Tunmise Ayode Otitoju et al. Advanced ceramic components: Materials, fabrication, and applications Author links open overlay panel, Elsevier, 2020. DOI: <https://doi.org/10.1016/j.jiec.2020.02.002>
- Susan M. Winchip (2017)., 'Fundamentals of Lighting', Fair Child Books, Bloomsbury., 2nd Edition.
- Michael Wilson and Peter Tregenza (2011)., 'Daylighting: Architecture and Lighting Design', Routledge.
- Mark Karlen, Christina Spangler (2012)., 'Lighting Design Basics', Wiley., 2nd Edition.
- Christopher Cuttle (2015)., 'Lighting Design: A Perception-Based Approach', Routledge.
- Gordon B. Arnold. Animation and the American Imagination: A Brief History. ABC-CLIO, 2016
- Jonathan Cooper. Game Anim: Video Game Animation Explained. Import, CRC Press, 2021.
- Elvin Hernandez. Set the Action! Creating Backgrounds for Compelling Storytelling in Animation, Comics, and Games. Routledge, 2017.
- Satyajit Ray (2013)., 'Our Films Their Films', Orient Blackswan.
- K. Hariharan, Sasikumar Krish (2017)., 'Film Studies: An Introduction', Oxford University Press.
- Kristin Thompson, David Bordwell (2010)., 'Film Art: An Introduction', McGraw-Hill Education., 10th Edition.

Supplementary Reading/ Design Journals:

- Julius Panero, Martin Zelnik (1979)., 'Human Dimension and Interior Space: A Source Book of Design Reference Standards', Watson-Guptill.
- Walter R. Stahel (2019)., 'The Circular Economy: A User's Guide', Routledge.
- Journals/other relevant reading materials as per instructors/coordinators.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester III: Design Innovation Cell

II Year III Sem

MDES231 – M. Des. Studio – III (Design Innovation Cell)

15 Credits

Objectives:

- Researching passenger needs and preferences for informed design.
- Generating innovative ideas for ship layout, cabins, amenities, and entertainment.
- Considering sustainability and environmental factors in design.
- Utilizing technologies like virtual reality, augmented reality, IoT and AI for onboard experiences.
- Designing inclusively for passengers with disabilities or special needs.
- Collaborating on immersive entertainment experiences, interactive installations, and wellness-focused amenities.

Module I: User/Design Research – Search, discover

Researching passenger needs and preferences for informed design:

Surveys and Questionnaires: Collecting quantitative data on passenger preferences, habits, and satisfaction levels. Engaging with passengers directly to gather in-depth qualitative insights about their experiences and expectations. Observing passengers in real-world settings to understand their behaviors and interactions without interference. Creating detailed profiles that represent different segments of passengers to guide design decisions. Visualizing the entire passenger experience from booking to disembarkation to identify pain points and opportunities for improvement.

Module II: Design Synthesis - Define insights, keywords, generate key ideas

Generating innovative ideas for ship layout, cabins, amenities, and entertainment:

Analyzing survey data to identify trends and significant patterns. Examining qualitative data from interviews and focus groups to extract common themes and insights. Using the gathered insights to inform design choices that address real passenger needs and preferences. Continuously refining designs based on feedback and testing with actual users. Generating Innovative Ideas for Ship Layout, Cabins, Amenities, and Entertainment Generating innovative ideas requires a combination of creativity, strategic thinking, and an understanding of passenger needs. This involves: Encouraging free-flowing ideas in a group setting to generate a wide range of concepts. Visualizing connections between different ideas to explore new possibilities. Applying specific prompts to existing ideas to create new innovations (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, Reverse). Understanding and articulating the specific challenges and constraints in ship design. Divergent Thinking: Exploring multiple potential solutions before narrowing down to the most viable options. Building physical or digital models of ideas to test their feasibility and appeal with real users. Specific Applications: Designing functional and aesthetically pleasing layouts that optimize space and flow while enhancing passenger experience. Creating comfortable and adaptable living spaces that cater to diverse passenger needs, including accessibility features. Amenities and Entertainment: Innovating on amenities (e.g., spas, fitness centers) and entertainment options (e.g., theaters, virtual reality experiences) to offer unique and engaging activities. Integrating eco-friendly materials and practices into design to minimize environmental impact. Technology Integration: Leveraging advanced technologies (e.g., smart cabins, interactive installations) to enhance passenger convenience and engagement.

Module III: Design Development - Develop ideas, ideation, brainstorm

Considering sustainability and environmental factors in design & Inclusive design:

Sustainability and environmental considerations have become paramount due to the growing awareness of ecological impacts and the need for responsible resource management. Sustainable design aims to minimize negative environmental effects by using resources efficiently, reducing waste, and creating products and systems that are eco-friendly throughout their lifecycle. This approach includes selecting materials with lower environmental footprints, designing for durability and recyclability, and reducing energy consumption in both the production and use phases. Key strategies include life cycle assessment (LCA) to evaluate the environmental impacts of products from cradle to grave, eco-design principles that prioritize the use of renewable resources, and the incorporation of circular economy concepts that promote reusability and recycling. Designers also focus on creating adaptable and modular products that can be easily repaired or upgraded, extending their lifespan and reducing the need for new materials. Modern technologies such as Virtual Reality (VR), Augmented Reality (AR), the Internet of Things (IoT), and Artificial Intelligence (AI) are revolutionizing onboard experiences, particularly in the context of transportation

and hospitality industries like cruise ships and airplanes. These technologies enhance passenger experiences by providing immersive, interactive, and personalized services.

Module IV: Design Prototyping & Testing - Implement, select, deliver

Utilizing technologies like virtual reality, augmented reality, IoT and AI for onboard experiences:

In the field of design, particularly in environments such as cruise ships, hotels, and public spaces, creating engaging and holistic experiences for users is paramount. This involves a multidisciplinary approach that integrates immersive entertainment, interactive installations, and wellness-focused amenities to enhance the overall experience and well-being of users. Immersive entertainment experiences are designed to deeply engage users, often by leveraging advanced technologies and creative storytelling. These experiences can range from virtual reality (VR) simulations and augmented reality (AR) applications to interactive theater and live performances. Creating immersive entertainment requires collaboration between designers, technologists, artists, and storytellers. Designers work with VR/AR developers, animators, and software engineers to create seamless and captivating experiences. They also collaborate with writers, directors, and performers to ensure that the content is compelling and engaging. The use of VR and AR can transport users to different worlds, provide interactive gaming experiences, or offer educational simulations. For instance, a VR installation on a cruise ship might allow passengers to explore underwater worlds or historic sites, while AR apps could enhance onboard activities with interactive elements.

Essential Reading

- The Elements of User Experience: User-Centred Design for the Web by Jesse James
- Observing the User Experience: A Practitioner's Guide to User Research by Mike Kuniavsky
- Sketching User Experiences: Getting the Design Right and the Right Design Book by Bill Buxton
- Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests (Paperback) by Jeffrey Rubin.
- Shneiderman, Ben; Designing the User Interface: Strategies for Effective Human-Computer Interaction. 1997
- "Observing the User Experience: A Practitioner's Guide to User Research" by Mike Kuniavsky
- "User Experience Research: Discover What Customers Really Want" by Stephanie Marsh
- "101 Things I Learned in Architecture School" by Matthew Frederick
- "Designing Spaces for Natural Ventilation: An Architect's Guide" by Ulrike Passe and Francine Battaglia
- "Design for Experience: Where Technology Meets Design and Strategy" by J. Robert Rossman and Mathew D. Duerden
- "Sustainable Design: A Critical Guide" by David Bergman
- "Cradle to Cradle: Remaking the Way We Make Things" by William McDonough and Michael Braungart
- "Augmented Reality: Principles and Practice" by Dieter Schmalstieg and Tobias Hollerer
- "The Fourth Industrial Revolution" by Klaus Schwab
- "Virtual Reality" by Steven M. LaValle
- "Inclusive Design: Designing and Developing Accessible Environments" by Rob Imrie and Peter Hall

Supplementary Reading/Design Journals:

- "Universal Design Handbook" by Wolfgang Preisner and Korydon H. Smith
- "The Experience Economy: Competing for Customer Time, Attention, and Money" by B. Joseph
- "Designing for Interaction: Creating Innovative Applications and Devices" by Dan Saffer
- "Wellbeing: A Complete Reference Guide, Wellbeing and the Environment" edited by Rachel Cooper, Elizabeth Burton, and Cary L. Cooper

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester III: Innovation & Iteration

Year II Sem III

MDES232 – Universal Human Values, Ethics & Environmental Psychology 04 Credits

Unit 1: Introduction to Environmental Psychology

- Understanding the fundamentals of environmental psychology
- Exploring the relationship between humans and their built environment
- Studying the psychological effects of different environmental factors
- Examining the influence of the physical surroundings on human behaviour and emotions
- Introducing key theories and research in environmental psychology

Unit 2: Human Behaviour and Its Influence

- Analysing human behaviour patterns in various contexts
- Understanding the impact of social and cultural factors on behaviour
- Exploring cognitive processes and decision-making in relation to the environment
- Investigating the influence of personal experiences and individual differences on behaviour
- Examining the role of perception and interpretation in shaping behaviour

Unit 3: Emotional and Sensory Aspects of Design

- Exploring the emotional responses evoked by different design elements
- Understanding the role of aesthetics and visual stimuli in eliciting emotions
- Examining the impact of sensory experiences (such as sound, touch, and smell) on emotions
- Analysing the use of colour, lighting, and materials to create specific emotional responses

Unit 4: Designing for Well-being and User Experience

- Investigating the relationship between environmental design and well-being
- Exploring the concept of user experience (UX) in relation to the built environment
- Understanding the role of design in promoting physical and mental health
- Examining the principles of user-centered design and its impact on well-being
- Studying the incorporation of nature, biophilia, and green spaces in design for enhanced well-being

Unit 5: Design for Environment

- Exploring the intersection of environmental psychology and sustainable design
- Understanding the role of environmental design in promoting sustainable behaviours
- Examining the concept of resilience and designing for adaptive environments
- Considering the ethical and social responsibility aspects of sustainable design

Essential Reading:

- Norman DA. Emotional Design: Why We Love (or Hate) Everyday Things. Basic Books; 2004.
- Norman, D. The Design of Everyday Things, Revised and Expanded Edition. Basic Books, New York, 2013.
- Gibson, J. The Ecological Approach to Visual Perception: Classic Edition, Psychology Press, 2014.
- Dak Kopec. Environmental Psychology for Design, Bloomsbury Academic, 2018.
- Dak Kopec. Environmental psychology for design, Fairchild Books, New York, 2020.
- Flach & Dominguez. USE - Centered Design: Integrating the User, Instrument, and Goal, Vol 3 (3). Doi: <https://doi.org/10.1177/106480469500300306>

- Harry Heft L. Erlbaum. Ecological Psychology in Context: James Gibson, Roger Barker, and the Legacy of William James's Radical Empiricism, Psychology Press, 2001.

Supplementary Reading/Journals:

- Mihaly Csikszentmihalyi. FLOW: The Psychology of Optimal Experience, Harper Perennial Modern Classics, 2008.
- Norman, D. The Psychology of Everyday Things, Basic Books, 1988.
- Journals, Papers, and reference materials as per topics & instructor.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester III: Innovation & Iteration

Year II Sem III

MDES233 – Design Prototyping and Iteration

05 Credits

Unit 1: Introduction to Prototyping Methods

- Overview of prototyping methods used in the design process
- Exploring techniques such as 3D modelling, paper prototyping, and rapid prototyping
- Understanding the benefits and limitations of each prototyping method
- Applying appropriate prototyping methods based on project requirements and constraints
- Introduction to prototyping tools and software

Unit 2: Materials and Tools for Prototyping

- Exploring a range of materials commonly used in prototyping, such as foam, wood, plastic, and electronics
- Understanding the properties and characteristics of different prototyping materials
- Introduction to prototyping tools and equipment, including hand tools, 3D printers, laser cutters, and electronics components
- Selecting appropriate materials and tools based on project needs and feasibility
- Safety considerations when working with prototyping materials and tools

Unit 3: Iterative Prototyping Process

- Emphasizing the iterative approach in the prototyping process
- Understanding the importance of creating multiple versions of prototypes
- Gathering feedback from stakeholders and users to inform design iterations
- Conducting design reviews and collaborative sessions to drive iterative improvements
- Incorporating user feedback into the prototyping process to enhance usability and functionality

Unit 4: Stakeholder and User Feedback in Prototyping

- Importance of stakeholder and user involvement in the prototyping process
- Techniques for gathering feedback from stakeholders and users
- Analyzing and interpreting feedback to identify areas for improvement
- Integrating stakeholder and user feedback into the design iterations
- Effective communication and collaboration with stakeholders and users during the prototyping phase

Unit 5: Agile Design and Prototyping

- Introduction to Agile design methodologies and their relevance to prototyping
- Applying Agile principles, such as rapid iterations and continuous improvement, to the prototyping process
- Managing prototyping projects in an Agile environment, including sprint planning, backlog management, and user story development
- Collaborating with cross-functional teams and adapting to changing requirements during prototyping
- Benefits and challenges of adopting an Agile approach in design and prototyping

Essential Reading:

- Bjarki Hallgrímsson. Prototyping and Model making for Product Design. Laurence King Publishing, 2012.
- Carla Viviana Coleman. Rapidly Prototyping Interfaces with InDesign. Taylor & Francis Group, New York, 2018.
- Mike Kuniavsky. Observing the User Experience: A Practitioner's Guide to User Research, Elsevier, 2003.
- Bill Buxton. Sketching User Experiences: Getting the Design Right and the Right Design Book, Morgan Kaufmann, 2010.
- Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests (Paperback) by Jeffrey Rubin.
- Eleven lessons. A study of the design process". Design Council, 2022.

- Journals, Papers, and reference materials as per topics & instructor

Supplementary Reading/ Design Journals:

- Christopher Alexander. Notes on the Synthesis of Form. Harvard University Press, 1964.
- Robert Curedale, Service Design Process & Methods, Design Community College Inc., 2018
- John Chris Jones, Design Methods: Seeds of Human Futures, Wiley.
- Don Norman, The Design of Everyday Things. Basic Books, New York, 2013.
- Design Studies, Elsevier; Design Issues, MIT Press
- Design and Culture, Taylor & Francis, The Design Journal, Taylor & Francis

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester III: Innovation & Iteration**Year II Sem III****MDES234 – Industry Training****03 Credits**

The 06-week internship in a design firm or relevant industry offers students a valuable opportunity to gain firsthand experience in the design field. This immersive experience exposes them to real-world projects and professional environments, allowing them to apply their theoretical knowledge and skills in a practical setting.

Through the internship, students have the chance to work alongside industry professionals, learning from their expertise and gaining insights into the industry's best practices. Additionally, the internship provides networking opportunities, enabling students to establish connections with industry experts and practitioners.

These connections can be valuable for future career prospects, mentorship, and accessing a wider professional network. Overall, the internship enhances students' understanding of the design industry, builds their professional capabilities, and helps them transition from academic studies to the professional world.

Note: MDES234 – Industry Training will be for a period of 06 weeks at the end of Sem II and evaluated as a part of Sem III.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester III: Innovation & Iteration

Year II Sem III

MDES1235 – Elective - III

03 Credits

a) Cruise Ship Recreation and Experience Design

- Designing engaging recreational spaces and experiences on cruise ships.
- Considering passenger demographics and preferences for inclusive options.
- Integrating technology and digital interfaces for enhanced experiences.
- Balancing safety, comfort, and aesthetics in recreational area design.

b) Landscape & Signage Design

- Creating appealing and functional outdoor spaces.
- Designing wayfinding systems and signage for navigation.
- Considering accessibility and inclusivity.
- Collaborating with stakeholders for integration.
- Enhancing user experience and interaction with the environment.

c) Handicraft & Textile Design

- Creating unique textile and handicraft products using traditional techniques.
- Incorporating sustainability and ethical considerations in material selection.
- Balancing aesthetics and functionality for fashion, home decor, and art.
- Experimenting with innovative techniques and technologies.

d) Transport & Automobile Design

- Designing vehicles with a focus on aesthetics, functionality, and user experience.
- Incorporating innovative technologies and materials for performance and sustainability.
- Considering ergonomics, safety, and brand identity in vehicle design.
- Collaborating with engineers and manufacturers for feasibility and production readiness.

e) Interaction and Interface Design

- Designing intuitive interfaces for digital products and services.
- Conducting user research and usability testing.
- Creating wireframes, prototypes, and mock-ups for visualization.
- Implementing designs with developers and engineers.

Essential Reading:

- Choudhary & Kumar. Seafaring Elegance: The Art of Cruise Interior Design. LWRN Studio, 2024.
- Peter & Peter. Cruise: Identity, Design and Culture, Rizzoli International Publications, 2006
- Indian Handloom and Handicrafts by Mukherjee &, Debashree, 2009.
- Handloom Industry in India: An Overview by K.S Suresh Kumar & C. Ganesh. 2014
- Jordan Meadows. Vehicle Design: Aesthetic Principles in Transportation Design, Routledge, 2017.
- Stein, J.A. Curves of Steel: Streamlined Automobile Design at Phoenix Art Museum, Coach built Press, 2009.
- Wilbert O. Galitz. The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, Wiley & Sons, 2002.

Supplementary Reading/ Design Journals:

- Kelley, P. Imagine!: Automobile Concept Art from the 1930s to the 1980s. Dalton Watson Fine Books, 2019.
- Woodson Wesley E, Human Factors Design Handbook, McGraw-Hill Education; 1992
- Norman, Donald: A Design of Everyday Things, Basic Books, 2002
- The Elements of User Experience: User-Centred Design for the Web by Jesse James
- Observing the User Experience: A Practitioner's Guide to User Research by Mike Kuniavsky
- Sketching User Experiences: Getting the Design Right and the Right Design Book by Bill Buxton
- Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests (Paperback) by Jeffrey Rubin.
- Shneiderman, Ben; Designing the User Interface: Strategies for Effective Human-Computer Interaction. 1997
- Journals/relevant materials as per instructor/ccordinators.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester IV: Design Thesis and Entrepreneurship

Year II Sem IV

MDES241 – M. Des. Studio – IV (Thesis)

24 Credits

Thesis Project:

The student, in partial fulfillment of M. Des. programme, would be required to complete a design project on a choice-based system under the supervision of designated thesis guides. The project or artefact design should have adequate theoretical basis, and be supported by proof of concepts, and above all a prototype. The project would have to be approved by concerned faculties, and it should have the potential to demonstrate the student's design maturity, attitude, aptitude and approaches as a professional. The student's capacity and aptitude to study, research, analyze, and iterate upon design concepts and solutions would be reflected in this thesis exercise. Upon allocation of thesis guide, the student would earnestly seek the guidance, and mentorship of the faculty concerned.

Exhibition:

This exhibition would be for evaluation of the final project through assessment by the guide and final jury member(s). These exhibitions may involve university exhibition to the jury member(s) or exhibition to the public on other platforms, besides the university, if possible. Placement, preparation of portfolio, and other industry activities are the responsibility of the student, and may be in coordination of support from faculty and the university concern. Internal and external marking systems may be divided into 50% each.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester IV: Design Thesis and Entrepreneurship

Year II Sem IV

MDES242 – Intellectual Property Rights, Professional Practice & Management (3L) 03 Credits

Unit 1: Introduction to Intellectual Property Rights

- Overview of intellectual property rights and their significance in the design industry.
- Understanding different forms of intellectual property, such as copyrights, trademarks, and patents.
- Exploring the importance of protecting and managing intellectual property assets.

Unit 2: Copyright and Design Protection

- Understanding copyright laws and how they apply to design works.
- Exploring the scope of copyright protection for design creations and original works.
- Learning about copyright infringement and how to enforce copyright protection.

Unit 3: Trademarks and Brand Protection

- Introduction to trademarks and their role in branding and design.
- Understanding the process of trademark registration and maintenance.
- Exploring strategies for brand protection and enforcement of trademark rights.

Unit 4: Patents and Design Innovation

- Overview of patent laws and their relevance to design innovation.
- Understanding the criteria for patentability and the patent application process.
- Exploring the benefits and challenges of obtaining and enforcing design patents.

Unit 5: Professional Practice and Management

- Exploring the principles of professional practice in the design industry.
- Understanding ethical considerations and professional responsibilities in design work.
- Learning about project management techniques, client relationships, and effective communication in design practice.

Essential Reading:

- Gerre L. Jones. How to Market Professional Design Services, McGraw-Hill, 1973.
- Armstrong & McDowell. Fashioning Professionals: Identity and Representation at Work in the Creative Industries, Bloomsbury Publishing, 2018.
- Brean, D. H. In: Luchs, Swan, Griffin. Chapter 24-Intellectual Property Protection for Designs, Wiley & Sons, Inc. 2016.
- Gazette of India. THE DESIGNS ACT, 2000 No. 16 of 2000 [25th May, 2000].
- Govt. of India. Ministry of commerce & industry. THE DESIGNS RULES, 2001.

- Brigitte Borja De Mozota, Design Management: Using Design to Build Brand Value and Corporate Innovation, Allworth, 2003.
- Marty Neumeier, Brand Gap: How to Bridge the Distance Between Business Strategy and Design: a Whiteboard Overview, New Riders, 2006.
- W. Chan Kim and Renee Mauborgne. Blue Ocean Strategy: How to Create Uncontested Market Space and Make Competition Irrelevant. Harvard Business School Press, 2005
- Marc Annacchino. New Product Development: from Initial Idea to Product Management, Butterworth-Heinemann Ltd (16 October 2003)
- Kathryn Best. Design Management: Managing Design Strategy, Process and Implementation, Bloomsbury Publishing, 2015.
- Antonio Nieto-Rodriguez. Harvard Business Review Project Management Handbook: How to Launch, Lead, and Sponsor Successful Projects, Harvard Business Review Press, 2021
- DMI (Design Management Institute Journals) Journals

Supplementary Reading/ Design Journals:

- Design Management Journal, Wiley Online Library.
- Sharad Sarin. Strategic Brand Management for B2B Markets: A Road Map for Organizational Transformation, Atlantic Publishers and Distributors (P) Ltd., 2024.
- Tony Fry. Design Futuring: Sustainability, Ethics and New Practice, Berg publishers, 2009.

Masters in Design Program (M. Des.)

School of Planning and Architecture, Vijayawada

Semester IV: Design Thesis and Entrepreneurship

Year II Sem IV

MDES243 – Design Entrepreneurship and Business Strategies

03 Credits

Unit 1: Introduction to Entrepreneurship and Start-up Ecosystems

- Understanding the fundamentals of entrepreneurship
- Exploring the start-up ecosystem, including incubators, accelerators, and funding sources
- Identifying key characteristics and skills of successful entrepreneurs
- Examining case studies of successful design start-ups
- Developing an entrepreneurial mindset and identifying opportunities for design ventures

Unit 2: Business Model Development for Design Ventures

- Introduction to business models and their relevance to design ventures
- Understanding different types of business models, such as subscription-based, freemium, and marketplace models
- Conducting market research and competitive analysis to inform business model development
- Creating value propositions and identifying revenue streams for design ventures
- Validating and refining the business model through prototyping and customer feedback

Unit 3: Integrating Design into Business Strategies

- Recognizing the strategic value of design in business
- Exploring the role of design in shaping customer experience and differentiation
- Integrating design thinking into strategic planning processes
- Developing design leadership skills to drive innovation and growth
- Leveraging design as a competitive advantage and driver of business success

Unit 4: Branding, Advertisement and Packaging Design

- Understanding the importance of branding in establishing a strong identity for design ventures
- Developing brand strategies and positioning statements
- Designing visual identities, including logos, typography, packaging and colour schemes
- Creating compelling advertisement designs to effectively communicate brand messages
- Applying brand consistency across various marketing channels and touchpoints

Unit 5: Pitching for Design Start-ups

- Crafting a persuasive pitch for design start-ups
- Structuring and delivering effective presentations to potential investors and stakeholders
- Developing storytelling skills to engage and inspire audiences
- Incorporating visual design and multimedia elements in presentations
- Receiving and incorporating feedback to continuously improve pitching skills

Essential Reading:

- Kelley & Littman. The Ten Faces of Innovation: IDEO's Strategies for Beating the Devil's Advocate and Driving Creativity Throughout Your Organization, Currency/Doubleday, 2005.
- Armstrong Productize: The Ultimate Guide to Turning Professional Services into Scalable Products, Vectoris, 2021.
- Douglas Davis. CREATIVE STRATEGY AND THE BUSINESS OF DESIGN, Adams Media, 2016.
- Harvard Business Review. HBR Guide to Setting Your Strategy. Harvard Business Review Press, 2020
- William D'Arienzo, BRAND MANAGEMENT STRATEGIES : LUXURY AND MASS MARKETS - BUNDLE BOOK + STUDIO ACCESS CARD, Fairchild Books, 2016.
- Journals as per instructors/course coordinators.

Supplementary Reading/ Design Journals:

- Design Management Journal, Wiley Online Library.
- Harvard Business Review. HBR Guide to Managing Strategic Initiatives, Harvard Business Review Press, 2020.

**Remuneration/Honorarium Rates for External Academic Experts
Visiting SPA Vijayawada for Academic Assignments**
(From AY 2024-25 onwards)

	Remuneration Head	Current Norms of SPAV	Proposed Norms for SPAV
I	Lectures / Practicals :		
a)	Theory Subjects - For special lecture / interaction <u>upto max of 6 hrs in a day</u> (paid on hourly basis):		
	Experience > 10 years (paid on hourly basis):	Rs 1600	Rs 2000
	Experience < 10 years (paid on hourly basis):	Rs 1300	Rs 1500
b)	Studio / Lab Subjects - For special lecture / interaction <u>upto max of 6 hrs in a day</u> (paid on hourly basis):		
	Experience > 10 years (paid on hourly basis):	Rs 1300	Rs 1500
	Experience < 10 years (paid on hourly basis):	Rs 1000	Rs 1200
c)	Full Day Lecture / Interaction (beyond 6 hrs a day till full day and for 2 or 3 days continuously <u>having more than 6 hrs of interaction</u>) - For special lecture interaction in theory / lab / studio subjects (paid on Lumpsum Basis)	NIL	
	Experience > 10 years (paid on Lumpsum Basis)	Calculated Hourly as per Ia, Ib existing Norms	Rs 13000 for 1st day Rs 13000 for 2nd day
	Experience < 10 years (paid on Lumpsum Basis)		Rs 10000 for 1st day Rs 10000 for 2nd day
d)	Workshops / Conferences / Training Programmes / FDPs / FDEPs - (per lecture/interaction in a day upto max 3 hrs)		
	Experience > 10 years	Rs 1600	Rs 2500 / Hour upto a max of 3 hrs
	Experience < 10 years	Rs 1300	
II	Jury / Exams / Foreign Nationals' Lecture :		
a)	Jury Examinations / Viva Voce Exams / PhD periodic review <u>for 1 day</u> (involving <u>LESS</u> than 3 hrs a day) - (paid on Lumpsum Basis)	Rs 2500	Rs 4000
b)	Jury Examinations / Viva Voce Exams / PhD periodic review <u>for 1 day</u> (involving <u>MORE</u> than 3 hrs in a day) - (paid Lumpsum Basis)	Rs 5000	Rs 8000
c)	Jury Examinations / Viva Voce Exams / PhD periodic review <u>for 2 or 3 days continuously</u> (involving <u>more than 3 hrs per day</u>)		Rs 8,000 for 1st day Rs 8,000 for 2nd day (and subsequent days)
d)	PhD Report Evaluation and Defence / Viva Voce (paid on Lumpsum Basis)	Rs 5000	Rs 8,000 for evaluation Rs 10,000 for evaluation & viva-voce
e)	PhD Report Evaluation by Foreign Examiner to be paid in dollars – (paid on Lumpsum Basis)	USD 350	USD 500
f)	Remuneration / Honorarium for Foreign Nationals / NRI / PIO delivering lectures from abroad and would require payment in foreign currency <u>beyond 3 hrs upto 8 hrs a day</u> – (paid on hourly basis): - two slabs depending on years of experience & seniority	NIL	
	Experience > 10 years (paid on hourly basis):	NIL	USD 60 per hour
	Experience < 10 years (paid on hourly basis):	NIL	USD 40 per hour

III	Overall Cap and Limits :	Current Norms of SPAV	Proposed Norms for SPAV
a)	Limit to maximum <u>amount</u> in INR permissible for 1 Indian expert in one semester (excluding travel expense)	Maximum Rs 250000 / person	14 weeks*1500*12 hours/week = Rs 2,52,000 per person per semester
b)	Limit to maximum <u>hours</u> of lecture permissible for 1 foreign experts in one sem in one Department	NIL	
	Experience > 10 years	NIL	12 hours per expert per semester Equivalent to (12*60) USD 720 per person per semester
	Experience < 10 years	NIL	12 hours per expert per semester Equivalent to (12*40) USD 480 per person per semester
c)	Limit to maximum <u>hours</u> of lecture permissible for all foreign experts together in one sem in one Dept		120 hours per Dept per semester