

**Semester- III**

<b>GENERATIVE URBAN DESIGN</b>			
Course Code	MDAC301	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	02:06:02	Viva Marks	50
Total Hours of Pedagogy	10	Total Marks	100
Credits	8	Exam Hours	-
<p><b>Course Learning objectives:</b></p> <p>To explore new limits and possibilities of urban interventions that are assisted by parametric design principles. The aim is to hone and utilize parametric capacities and use them as a powerful tool that augments the multi-layered and collaborative urban design process and helps produce design solutions of greater resilience.</p>			
<b>Module- 1</b>			
<p>Introduction to analytical diagramming/information graphics post mapping for analysis and data representation tool acting at local and urban scale Stakeholder analysis, demographic study, climate studies, socio-economic analysis and related analysis of a wide range of urban forces</p>			
<b>Teaching-Learning Process</b>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>		
<b>Module-2</b>			
<p>Inferences from analysis in terms of Variables, Constraints &amp; Opportunities followed by 'problematization'(identification of key urban issues that need resolution wrt to design brief</p>			

<p><b>Teaching-Learning Process</b></p>	<p><b>ICT and Digital support:</b> Lecture will be conducted , through the use of powerpoint presentation  <b>Collaborative and Cooperative learning:</b> Analyse the digitized results and consider the input parameters for different iterations . to study the optimized result which further, facilitate the generation of different iterations for Product morphologies.</p>
<p><b>Module-3</b></p>	
<p>Development of design agenda and an urban concept that addresses the macro issues followed by a more specific strategy for the site that addresses micro issues/opportunities. Introduction of parametric platform as a vector field for site formulation -tools used elk, decoding spaces, urbano, pedism.</p>	
<p><b>Teaching-Learning Process</b></p>	<p><b>ICT and Digital support:</b> Lecture will be conducted , through the use of powerpoint presentation</p>
<p><b>Module-4</b></p>	
<p>Design evolution and refinement through selection and iteration within the parametric platform . Refinement and detailing in 3d and Detailing in 2d digital environment modelling environment and Post production and design representation techniques</p>	
<p><b>Module-5</b></p>	
<p>Students to place all the parametric analysis/ computational tools onto the given site and come up with analysis, inference , identify the problem and provide the solution</p>	
<p><b>Teaching-Learning Process</b></p>	<p><b>ICT and Digital support:</b> Lecture will be conducted , through the use of powerpoint presentation</p>
<p><b>Assessment Details (both CIE and SEE)</b>  The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p><b>Continuous Internal Evaluation:</b>  CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report</p> <p><b>Semester End Examination:</b></p> <ul style="list-style-type: none"> <li>The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.</li> </ul>	

- The Viva-voce will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.
- The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

**Suggested Learning Resources:**

**Books**

- Jacobs, Jane (1961), The Death and Life of Great American Cities, Random House
- Maas, Winy (2013), MVRDV: Agenda for Urbanism, O10 Publishers
- Schumacher, Patrick (2011), Total Fluidity, University of Applied Arts Vienna

**Web links and Video Lectures (e-Resources):**

- [https://www.researchgate.net/publication/255670004 Parametric Design in Urban Design](https://www.researchgate.net/publication/255670004_Parametric_Design_in_Urban_Design)
- <https://www.sciencedirect.com/science/article/pii/S209526351830044X>
- <https://otp.uni-weimar.de/courses/parametric-urban-design-analysis-puda-19-2/>

**Skill Development Activities Suggested**

Rhino - parametric / urban plug-ins

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
C01	To analyse area of analysis and optimization of multidisciplinary systems during the “conceive” and “design” phases	L2
C02	Develops and codifies a prescriptive approach to multidisciplinary modeling and quantitative assessment of new or existing system/product architectures	L2
C03	Rationalize and quantify a system architecture problem by selecting appropriate objective functions, design parameters and constraints	L2
C04	Subdivide a complex system into smaller disciplinary models, manage their interfaces and reintegrate them into an overall system model	L3

C05	To analyse and study buildings to understand the different generations / survival of the fittest / optimised results	L3
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**Program Outcome of this program. (CPM)**

Sl. No.	Description	POs
1	perform a critical evaluation and interpretation of analysis and optimization results, including sensitivity analysis and exploration of performance, cost and risk tradeoffs	P01
2	The course/project goal is to increase the student's knowledge in this area/field and skills/knowledge in the field of architecture in general	P02
3	The students will enter the project with varying degrees of knowledge/skills and will subsequently end up at different levels at the end of the course/project.	P03
4	The individual student must show an increase in the particular skills/knowledge offered and in the field of architecture in general	P04
5	be familiar with the basic concepts of multiobjective optimization, including the conditions for optimality	P05

**Mapping of COS and POS**

	P01	P02	P03	P04	P05
<b>CO1</b>	L	M	M	H	H
<b>CO2</b>	L	M	H	M	L
<b>CO3</b>	0	M	M	H	H
<b>CO4</b>	0	M	M	L	H
<b>CO5</b>	L	L	M	M	H

**H - High , M - Medium, L - Low**

**Semester- III**

<b>DISSERTATION PHASE -1</b>			
Course Code	MDAC302	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	00:02:01	Viva Marks	50
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-
<p><b>Course Learning objectives:</b></p> <ul style="list-style-type: none"> <li>● The objective of the dissertation is to provide an opportunity to the students to prepare independent and original study of a special project of his/her own choice</li> <li>● The project provides students an opportunity for academic research to cultivate specialization in the areas of their own interest under the overall guidance of the faculty</li> <li>● The objective of the seminar work is to train the students to prepare state of art report by assimilation of concepts / ideas on a chosen topic in the area of Building Engineering and Management.</li> </ul>			

**COURSE CONTENT**

**Research Content:** The dissertation/ thesis is an individual research project that is a major piece of work undertaken by the students. It is a continuation of the Dissertation phase-1 of the previous semester. They are expected to select a topic on a live problem in the industry or a macro-issue having a bearing on performance of the real estate, construction or urban infrastructure industry. The topic should be researchable and involve scientific design of a study, collection and analysis. The aim is to prepare a state of art report on the chosen topic and develop hypotheses to be tested through the research methodology designed for the purpose.

The thesis proposal should include an overview of the proposed plan of work, including the general scope of your project, your basic research questions, research methodology, and the overall significance of your study. In short, the proposal should explain what to study, how to study this topic, why this topic needs to be studied.

Thesis proposals are designed to

- Justify and plan (or contract for) a research project.
- Show how your project contributes to existing research.
- Demonstrate to your advisor and committee that you understand how to conduct discipline specific research within an acceptable time-frame.
- Recommend future study areas for research.

**Research Process:** Students are required to test their outcome proposals through various methods, including questionnaire surveys and case studies. Students must create an innovative insight on the specific issues.

Thesis work includes processes such as: Research area identification; hypothesis of research topic; literature sourcing and search; aim and objective definition; formulation of methodology; field study planning; survey data collection, analysis and result presentation; literature study; conceptual an empirical :compilation and inference drawing; research study validation through case studies, field application and simulation models; discussion of findings of research findings; study conclusion and recommendation formulations. The progress of the Thesis work is presented and discussed by the student periodically in the classroom environment and progress monitored continuously. This work develops the comprehension and presentation skills of the students. The students are provided guidance from the faculty to channelize their thoughts.

**Area of Research:** The subject for special study may be conceptual or practical but pertaining to Building Engineering and Management in areas like Building Engineering, Construction technology ,Structural systems , Energy efficient building materials & techniques , Construction project management, Time management, Cost management, Quality management, Safety management, Contract Administration, Design management, Construction financial management, Human resource management, Quantitative techniques, Energy management, Building services, Building management systems, Infrastructure services , Management information systems , Project planning and feasibility and Disaster management

**Presentation:** The dissertation Project shall be submitted in the form of drawings, project report, models, slides etc. Relevant details/codes, schematic charts, reports and photographs.

**Teaching-Learning Process**

*Critical review with constructive suggestions / feed backs has to be provided by the Guide/ co-guide during the progress of the dissertation*

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation:**

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for Dissertation Stage -2, shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the Dissertation report.

**Semester End Examination**

- The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.
- The Viva-voce will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.
- The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

**Suggested Learning Resources:****Books**

- Creswell, J. W; Research Design: Qualitative, quantitative and mixed methods approaches, 2nd Ed., Thousand Oaks: Sage. 2003.
- Kothari, C.R; Research Methodology: Methods and Techniques, New Delhi: WishwaPrakashan. 2005
- Sanoff, H; Visual research methods in design, USA: Van Nostrand Reinhold. 1991

**Web links and Video Lectures (e-Resources):**

- [Thesis Format | Dissertation Format | Paper, Structure, Sample | Leverage Edu](#)

**Skill Development Activities Suggested**

- Guest lecture
- Review of research papers
- Workshops / seminars by industry experts
- Site visits / case studies

<b>Course outcome (Course Skill Set)</b>								
At the end of the course the student will be able to :								
Sl. No.	Description	Blooms Level						
C01	Prepare an extensive literature study and data collection from the field and presentation in the form of drawings, relevant details/codes, schematic charts, reports and photographs	L3						
C02	Develop a hypothesis to be tested through the research methodology designed for the purpose with innovative insight on specific issues thereby undertaking academic research independently.	L3						
C03	Experiment with research processes.	L4						
C04	Propose areas for further research and development	L5						
<b>Program Outcome of this program. (CPM)</b>								
Sl. No.	Description	POs						
1	Acquire outstanding fundamental knowledge in the field of Construction Project Management.	P01						
2	Encompass the ability to work in collaboration with interdisciplinary teams	P02						
3	Demonstrate creativity in the problem-solving process through professional quality graphic presentations and technical drawings.	P03						
4	Acquire outstanding knowledge & software skills for design, construction, resources management and scheduling & Monitoring of projects	P04						
5	Understanding the diverse needs of values and systems of society and providing sustainable solutions	P05						
6	Demonstrate design solutions that integrate contextual, social, economic, cultural, ethical, environmental concerns	P06						
7	Ability to do independent/option-based research and exploration of advanced and emerging topics.	P07						
8	Appraise professional standards and ethical responsibilities as a team member	P08						
<b>Mapping of COS and POS</b>								
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>
<b>CO1</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>CO2</b>	<b>H</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>CO3</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>CO4</b>	<b>M</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>
<b>H – High , M – Medium, L - Low</b>								

**Semester- III**

<b>PARAMETRIC LANDSCAPE URBANISM</b>			
Course Code	MDAE314A	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	03:00:00	Term work	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-



<p><b>Course Learning objectives:</b></p> <p>The objective of this elective course is to allow students to cover a varied spectrum of domains of investigation within the premise of parametric urbanism. This course seeks to posit the role of different experimental threads within the broader context of parametric urbanism.</p>	
<p><b>Module- 1</b></p>	
<p>To provide students with the necessary theoretical knowledge and technical skills for analysing, documenting and interpreting urban landscape.to make students understand through ecological awareness, different methods have been investigated to explore the relationship between nature and design. Additionally, digital techniques and methods have begun to dominate all elds of professions, including design disciplines.</p>	
<p><b>Teaching-Learning Process</b></p>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>
<p><b>Module-2</b></p>	
<p>To familiarize the students with 'landscape urbanism' interventions. aims to construct a new logic to interrelate multiple urban systems, including fabric modulation, street systems, and a system of open spaces. Patrick Schumacher</p>	
<p><b>Teaching-Learning Process</b></p>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>
<p><b>Module-3</b></p>	
<p>Landscape Urbanism - to produce new open-space morphol-ogies by generating, integrating and mediating ecological systems with a well-developed understanding of the ground as well as deploying a built form that incorporates a new in-frastructural sensibility</p>	
<p><b>Teaching-Learning Process</b></p>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>
<p><b>Module-4</b></p>	
<p>Algorithmic approach- Computation obtains an algorithmic logic that is deterministically rational,decisive and systematized. students should explore methodology, site constraints, generation of the computational geometry ,optimization process</p>	
<p><b>Teaching-Learning Process</b></p>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>
<p><b>Module-5</b></p>	
<p>To integrate the sub-systems into the masterplan including the infrastructure, water and waste management of the landscape. It is possible to assess the NURBS-based surface model of the landscape as a 3D terrain by integrating issues related to the ground.</p>	

<p><b>Teaching-Learning Process</b></p>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>
<p><b>Assessment Details (both CIE and SEE)</b></p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p><b>Continuous Internal Evaluation:</b></p> <p>CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report</p> <p><b>Viva- Voce Examination:</b></p> <ul style="list-style-type: none"> <li>● The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.</li> <li>● The Viva-voce will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner.</li> <li>● The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.</li> </ul>	
<p><b>Suggested Learning Resources:</b></p> <p><b>Books</b></p> <ul style="list-style-type: none"> <li>● Patrick Schumacher; Parametric Urbanism</li> <li>● Toni Oosterland; The Digital Design in Sustainable Urbanism – Explorations in computational design strategies</li> <li>● EVOLO ; Digital and parametric architecture</li> <li>● Tomas Michael; Hybrid architecture for future urbanism</li> </ul>	
<p><b>Web links and Video Lectures (e-Resources):</b></p> <ul style="list-style-type: none"> <li>● <a href="https://www.researchgate.net/publication/312061212_A_parametric_landscape_urbanism_method_The_search_for_an_optimal_solution">https://www.researchgate.net/publication/312061212_A_parametric_landscape_urbanism_method_The_search_for_an_optimal_solution</a></li> <li>● <a href="https://etd.lib.metu.edu.tr/upload/12621258/index.pdf">https://etd.lib.metu.edu.tr/upload/12621258/index.pdf</a></li> <li>● <a href="http://papers.cumincad.org/data/works/att/ecaade2017_143.pdf">http://papers.cumincad.org/data/works/att/ecaade2017_143.pdf</a></li> </ul>	

**Skill Development Activities Suggested -**

- Students will be aware of the tools and methodology needed to analyse urbanism

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
CO1	Build the tools to thrive in rigorous intellectual and practice environments, where questions about the site and the environment are investigated through design research and design thinking.	L2
CO2	Learn to work collaboratively and in an interdisciplinary manner across scales integrating the understanding of programmatic needs, contextual/environmental conditions, technological challenges, social structures and historical/theoretical meaning.	L3
CO3	To think like a native of a place, understanding of the ecologies of this region, its historical and cultural context and the equitable opportunities and value of urban life	L3
CO4	To understand the cultural stability of the city	L4
CO5	To understand the tools and methodologies to understand urbanism	L4

**Program Outcome of this program. (CPM)**

Sl. No.	Description	POs
1	The generation of digital tools makes it possible to use parametric design as a way of evolving new information systems, new ways of producing building components and architecture.	P01
2	The course/project goal is to increase the student's knowledge in this area/field and skills/knowledge in the field of architecture in general	P02
3	The students will enter the project with varying degrees of knowledge/skills and will subsequently end up at different levels at the end of the course/project.	P03
4	The individual student must show an increase in the particular skills/knowledge offered and in the field of architecture in general	P04
5	To critically interpret and understand product design+robotics	P05

**Mapping of COS and POS**

	PO1	PO2	PO3	PO4	PO5
CO1	L	M	M	H	H
CO2	M	L	M	M	M
CO3	L	L	M	M	M
CO4	L	L	H	H	M
CO5	M	L	L	H	H

**H – High , M – Medium, L - Low**

**Semester- III**

<b>SUSTAINABLE URBAN DESIGN</b>			
Course Code	MDAE314B	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	03:00:00	Term work	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-
<p><b>Course Learning objectives:</b></p> <p>The objective of this elective course is to allow students to cover a varied spectrum of domains of investigation within the premise of parametric urbanism. This course seeks to posit the role of different experimental threads within the broader context of parametric urbanism.</p>			
<b>Module- 1</b>			

	To develop architectural, urban design skills and awareness through the design of architectural and urban interventions at an appropriate scale and resolution, in response to a brief. To adopt novel approaches to the generation of design concepts, and to develop these in detail in response to the circumstances of both the physical, cultural and intellectual context
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-2</b>	
	To introduce and analyse contemporary urban design theories and practice including their evolution from historical practice to develop a critical understanding of the contemporary city and how people engage with it. This will include an analysis of the visual, social, functional, perceptual and environmental dimensions of the practice of urban design.
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-3</b>	
	Sustainable Cities - introduces the key theories of how a city works and its impact on the environment.It makes the students aware that sustainable cities are a product of both spatial patterns and social realities. The module examines a range of issues and challenges with a particular focus on environmental impact (local -global integration).
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-4</b>	
	Towards Sustainable Design Principle- futurity ,environmental diversity, carrying capacity, the precautionary principle, equity/quality of life / local empowerment - concept of sustainable cities - 3 key systems-
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-5</b>	
	The theory of sustainable development, solutions to a sustainable city, understanding the concepts through detailed understanding of urban examples
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>

**Assessment Details (both CIE and SEE)**

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**Continuous Internal Evaluation:**

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report

**Viva- Voce Examination:**

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**Suggested Learning Resources:**

**Books**

- Patrick Schumacher; Parametric Urbanism
- Toni Oosterland; The Digital Design in Sustainable Urbanism – Explorations in computational design strategies
- EVOLO ; Digital and parametric architecture
- Tomas Michael; Hybrid architecture for future urbanism

**Web links and Video Lectures (e-Resources):**

- [https://www.researchgate.net/publication/322617880\\_Sustainable\\_urban\\_design\\_with\\_an\\_approach\\_in\\_sustainable\\_urban\\_development](https://www.researchgate.net/publication/322617880_Sustainable_urban_design_with_an_approach_in_sustainable_urban_development)
- <https://www.archdaily.com/964460/6-urban-design-projects-with-nature-based-solutions>
- [https://discovery.ucl.ac.uk/92934/7/Carmona\\_Sustainabilitypaper1.pdf](https://discovery.ucl.ac.uk/92934/7/Carmona_Sustainabilitypaper1.pdf)

**Skill Development Activities Suggested -**

- Students will be aware of the tools and methodology needed to analyse urbanism

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
C01	Build the tools to thrive in rigorous intellectual and practice environments, where questions about the site and the environment are investigated through design research and design thinking.	L2
C02	Learn to work collaboratively and in an interdisciplinary manner across scales integrating the understanding of programmatic needs, contextual/environmental conditions, technological challenges, social structures and historical/theoretical meaning.	L3
C03	To think like a native of a place, understanding of the ecologies of this region, its historical and cultural context and the equitable opportunities and value of urban life	L3
C04	To understand the cultural stability of the city	L4
C05	To understand the tools and methodologies to understand urbanism	L4

**Program Outcome of this program. (CPM)**

Sl. No.	Description	POs
1	The generation of digital tools makes it possible to use parametric design as a way of evolving new information systems, new ways of producing building components and architecture.	PO1
2	The course/project goal is to increase the student's knowledge in this area/field and skills/knowledge in the field of architecture in general	PO2
3	The students will enter the project with varying degrees of knowledge/skills and will subsequently end up at different levels at the end of the course/project.	PO3
4	The individual student must show an increase in the particular skills/knowledge offered and in the field of architecture in general	PO4
5	To critically interpret and understand product design+robotics	PO5

**Mapping of COS and POS**

	PO1	PO2	PO3	PO4	PO5
C01	L	M	M	H	H
C02	M	L	M	M	M
C03	L	L	M	M	M
C04	L	L	H	H	M
C05	M	L	L	H	H

**H – High , M – Medium, L - Low**

**Semester- III**

<b>GENERATIVE ALGORITHM</b>			
Course Code	MDAE314C	CIE Marks	100
Teaching Hours/Week (L:P:SDA)	03:00:00	Term work	-
Total Hours of Pedagogy	3	Total Marks	100
Credits	3	Exam Hours	-
<p><b>Course Learning objectives:</b></p> <p>The objective of this elective course is to allow students to cover a varied spectrum of domains of investigation within the premise of parametric urbanism. This course seeks to posit the role of different experimental threads within the broader context of parametric urbanism.</p>			
<b>Module- 1</b>			
<p>On generation – rule based approach- Design support systems for sustainable development ,“Smart Solutions for Spatial Planning,A designer-centered shape grammar editor and interpreter-Cities as diachronic models: The spatial logic of growth and its role as a generative design component-City Induction Generation Module - Structuring a generative model for urban design: linking GIS to shape grammars</p>			
<b>Teaching-Learning Process</b>	<p><i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i></p>		



<b>Module-2</b>	
On the urban program formulation- City Induction Formulation Module - Towards a Computational Description of Urban Patterns	
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-3</b>	
On evaluation- CityZoom: A Visualization Tool for the Assessment of Planning Regulations-City Induction Evaluation Module - Integrating spatial analysis techniques in the parametric urban design process	
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-4</b>	
Static networks, dynamic networks,- evolutionary algorithms, and multi-objective algorithm for simultaneously optimizing more than one criterion-infrastructure- different ways of moving	
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>
<b>Module-5</b>	
Cities are centers of integration, and urban infrastructure evolves to maximize integration. Multi-objective optimization allows us to create a set of designs for infrastructure that seek to minimize cost while maximizing integration, with varying tradeoffs- genetic algorithms , curvilinear forms	
<b>Teaching-Learning Process</b>	<i>ICT and Digital support: Lecture will be conducted , through the use of powerpoint presentation</i>

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation:**

CIE marks shall be awarded by a committee comprising of Principal/Dean, PG Course Coordinator/HOD and Guide/Co-guide of the department. The CIE marks awarded for PSC (professional supportive course), shall be based on the progress of the student throughout the semester, presentation skills in seminars and submission of the report

**Viva- Voce Examination:**

- The student needs to submit his/her report done throughout the semester, including the data collection for the Viva examination, at least one day prior to the Viva examination to the PG course coordinator/HOD.
- The Viva-voce will be evaluated by external examiners appointed by the University along with PG Course coordinator/ guide/ co-guide or an internal examiner..
- The viva-voce marks list generated is to be signed by both internal and external examiners and submitted to VTU in the sealed cover through the Principal of the institution.

**Suggested Learning Resources:**

**Books**

- Patrick Schumacher; Parametric Urbanism
- Toni Oosterland; The Digital Design in Sustainable Urbanism – Explorations in computational design strategies
- EVOLO ; Digital and parametric architecture
- Tomas Michael; Hybrid architecture for future urbanism

**Web links and Video Lectures (e-Resources):**

- [http://home.fa.utl.pt/~jduarte/dcc08\\_workshop/notes/2008\\_Proceedings\\_Workshop\\_1\\_DCC08.pdf](http://home.fa.utl.pt/~jduarte/dcc08_workshop/notes/2008_Proceedings_Workshop_1_DCC08.pdf)
- <https://journals.sagepub.com/doi/10.1177/2399808319894986>
- [https://www.youtube.com/watch?v=pHZA\\_xioyb8](https://www.youtube.com/watch?v=pHZA_xioyb8)

**Skill Development Activities Suggested -**

- Students will be aware of the tools and methodology needed to analyse urbanism

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
C01	Build the tools to thrive in rigorous intellectual and practice environments, where questions about the site and the environment are investigated through design research and design thinking.	L2
C02	Learn to work collaboratively and in an interdisciplinary manner across scales integrating the understanding of programmatic needs, contextual/environmental conditions, technological challenges, social structures and historical/theoretical meaning.	L3
C03	To think like a native of a place, understanding of the ecologies of this region, its historical and cultural context and the equitable opportunities and value of urban life	L3
C04	To understand the cultural stability of the city	L4
C05	To understand the tools and methodologies to understand urbanism	L4

**Program Outcome of this program. (CPM)**

Sl. No.	Description	POs
1	The generation of digital tools makes it possible to use parametric design as a way of evolving new information systems, new ways of producing building components and architecture.	PO1
2	The course/project goal is to increase the student's knowledge in this area/field and skills/knowledge in the field of architecture in general	PO2
3	The students will enter the project with varying degrees of knowledge/skills and will subsequently end up at different levels at the end of the course/project.	PO3
4	The individual student must show an increase in the particular skills/knowledge offered and in the field of architecture in general	PO4
5	To critically interpret and understand product design+robotics	PO5

**Mapping of COS and POS**

	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>M</b>
<b>CO2</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>M</b>	<b>M</b>
<b>CO3</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>H</b>
<b>CO4</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>H</b>
<b>CO5</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>H</b>

**H – High , M – Medium, L - Low**