PREAMBLE-

Digital design is an emerging area in Architecture and the M.Arch Computer Applications program is designed to prepare students to specialize in this area which has a high potential in future architectural career. Concepts from computation and contemporary sciences and their impact in the domain of architecture and urban design are investigated. This course encourages inquiries into methods and representations for design, the development of design tools, applications of digital technologies to design practice, the impacts of these technologies on the built environment and their social and cultural implications. Students enrolled in Computer Applications take subjects and do research in theory and applications of computation and computer technology including computer graphics, digital modeling and rendering, generative design, CAD/CAM and rapid prototyping technologies, remote collaborative design, and the design processes and management systems. It will probe concepts such as behavioural, parametric and generative design, algorithmic logic and key ideas from quantum physics, biology and systems theory as a knowledge resource and means of production. A productive dialogue will be initiated with experts from other fields, including mathematics, computer science and engineering, under the larger collaborative platform of Computational design. Students are exposed to various new concepts like: Digital Tectonics , Digital Morphogenesis, Parametric design , Generative architecture , Performative Design ,Parametric Urbanism , Hypertecture and Evolutionary prototyping. The program has a main digital design studio which runs through three semesters culminating in the thesis. Students undertake professional training during the course too.

Digital Design Studio :-

• Basic concept formulation, non-linear geometry and parametric thinking

• Sustainable design concepts and design based on data streaming

• Parametric Urbanism design projects using information mapping and research paper

• Research paper and Computer Applications project

Supporting Technical Subjects are :-

• Visualization and animation – advance 3D software and programming

• Advance building construction concepts through digital fabrication and automated design

• Building Information Modelling – simulation and analytical methods using software

• Management Information Systems – Management at all stages from design development to execution

• Geographic Information Systems – information Mapping and querying

Skill Development Classes are :- in software training, programming, colloquium, academic writing and research methods.

OBJECTIVES :-

Architecture as a built reality maintains a close relationship to the mode and techniques of representation. The advent of digital software has released a unique potential that can lead to a significant rethinking, re-imaging and reconfiguration of the built environment. This course offers the opportunity to be at the forefront of interrogation in this field.

SCOPE AND OPPORTUNITIES:-

This course offers an opportunity to be at the forefront of the emergent practice of digital architecture. The graduates of this course can be absorbed in the mainstream Architecture or many related fields like Architectural Visualization, Building Management Systems, Software Development, etc.

PROGRAM EDUCATIONAL OBJECTIVES [PEO]

PEO1 - Concepts from computation and contemporary sciences and their impact in the domain of Architecture and urban design are investigated.

PEO2 – Innovative open exchange programs and dialogue between faculty, students, experts of allied field and practicing professionals to encourage the practice in the field of Digital Architecture.

PEO3 – Contribution to the design profession around the globe through modern tools and technologies.

PEO4 – Understanding the impact on environment and crucial role of an architect towards sustainable methods, an integral part of the curriculum.

PEO5 -Crafting well-educated, responsible, sensible and motivated architects equipped with ultra-modern skills, who can contribute towards building a humane society for the future.

PROGRAM OUTCOMES [PO]

PO1 –
Investigating Computational tools for computer modelling, rendering, simulation, analysis and parametric thinking process in Architectural Design.

PO2 –
Broadly understand the established and ongoing developments and research work in the domain of emerging technologies e.g. digital media and computational design.

PO3 –
Understanding of different digital design theories in Architecture and its application in different scales of Design.

PO4 –
Exploring building and its applications with respect to energy efficiency, climate control, light, sound and noise controls.

PO5 –
Exposure to the practical work of digital fabrication and latest technologies in fabrication.

MATRIX OF PROGRAM EDUCATIONAL OBJECTIVES AND PROGRAM OUTCOMES

PEO	PO1	PO2	PO3	PO4	PO5
PE01	√	√	√		
PEO2	√	√			√
PEO3	√				√
PEO4	√			√	
PEO5	√		√	√	

Sr.No.	Program Outcomes	Subjects in curriculum
1	PO1-	Digital tools and techniques, Elective II
2	PO2-	Elective I
3	PO3-	Digital Design theory
4	PO4-	Automated Design
5	PO5-	Digital Fabrication, Digital Practices and Professional Training

Sr.No.	Electives	Tentative Subjects of Electives
01	Elective I [First Year]	Colloquium
02	Elective II [First Year]	Robotics and Embedded Systems
03	Elective III [Second Year]	Open Elective

M-Arch (Computer Applications) **For Semesters I**

Course Code	Course Title	Course Type	Contact Periods (60 mins)	Teaching Scheme			Examination Scheme				
				Theory/ week	Studio/ week	Credits	SS	SV	Theory		Marks
									In semester	End semester	
2019CA101	Digital Design Studio I	**C1**	10	2	8	10		400	Nil	Nil	**400**
2019CA102	Elective I	**EL**	3	2	1	3	100	Nil	Nil	Nil	**100**
2019CA103	Digital Tools and Techniques I	**C2**	4	2	2	4	200	Nil	Nil	Nil	**200**
2019CA104	Digital Design Theory I	**SP1**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA105	Automated Design	**SP2**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA106	Digital Fabrication	**L**	2	1	1	2	100	Nil	Nil	Nil	**100**
			25	11	14	25					**1000**

M-Arch (Computer Applications) **For Semesters II**

Course Code	Course Title	Course Type	Contact Periods (60 mins)	Teaching Scheme			Examination Scheme				
				Theory/ week	Studio/ week	Credits	SS	SV	Theory		Marks
									Insemester	End semester	
2019CA201	Digital Design Studio II	**C1**	10	2	8	10		400	Nil	Nil	**400**
2019CA202	Elective II	**EL**	3	2	1	3	100	Nil	Nil	Nil	**100**
2019CA203	Digital Tools and Techniques II	**C2**	4	2	2	4	200	Nil	Nil	Nil	**200**
2019CA204	Digital Design Theory II	**SP1**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA205	Research I	**SP2**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA206	Computer Graphics	**L**	2	1	1	2	100	Nil	Nil	Nil	**100**
			25	11	14	25					**1000**

M-Arch (Computer Applications) For Semesters III

Course Code	Course Title	Course Type	Contact Periods (60 mins)	Teaching Scheme			Examination Scheme				
				Theory/ week	Studio/ week	Credits	SS	SV	Theory		Marks
									Insemester	End semester	
2019CA301	Digital Design Studio III	**C1**	10	2	8	10		400	Nil	Nil	**400**
2019CA302	Research II	**C2**	3	2	1	3	100	Nil	Nil	Nil	**100**
2019CA303	Digital Practices and Professional Training**	**C3**	4	2	2	4		200	Nil	Nil	**200**
2019CA304	Interaction Design	**SP1**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA305	Smart Materials and Advanced Construction	**SP2**	3	2	1	3	Nil	Nil	30	70	**100**
2019CA306	Computational Design Skills	**L**	2	1	1	2	100	Nil	Nil	Nil	**100**
			25	11	14	25					**1000**

**This includes Professional Training (40 full working days) to be undertaken during intermediate time between II & III Semester, details of which are mentioned in the detailed syllabus. The Oral Assessment of the same will be held at the end of Semester III. The subject is included as core subject and will have both sessional and viva assessment.

M-Arch (Computer Applications) **For Semesters IV**

Course Code	Course Title	Course Type	Contact Periods (60 mins)	Teaching Scheme			Examination Scheme				
				Theory/ week	Studio/ week	Credits	SS	SV	Theory		Marks
									In semester	End semester	
2019CA401	Project	**C**	20	4	16	20		800	Nil	Nil	**800**
2019CA402	Elective III*	**EL**	5	1	4	5	200	Nil	Nil	Nil	**200**
			25			25					**1000**

*Elective III can be offered as an open elective. In case it is not possible to offer open elective, colleges should offer any elective from the list of electives which the student has not undertaken in any previous semester.