UNIVERSITY OF PUNE

COURSE STRUCTURE

AND

SYLLABUS

FOR

MASTER OF ARCHITECTURE

M. ARCH.
(COMPUTER APPLICATIONS)

FACULTY OF ENGINEERING
BOARD OF STUDIES IN ARCHITECTURE

MASTER'S DEGREE IN ARCHITECTURE
M. ARCH. (COMPUTER APPLICATIONS)

INTRODUCTION:
This course examines computation and digital technologies, broadly conceived, as means to explore architecture and the design process. This course encourages inquiries into methods and representations for design, the development of design tools, applications of digital technologies to design practice and teaching, the impacts of these technologies on the built environment, and their social and cultural implications. Students centered in Computation 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 process and management systems.

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.

PROVISION OF INFRASTRUCTURE:
The provision of infrastructure for Master's Course shall be done as per the guidelines laid down by AICTE, regarding intake of students, class rooms, studios, laboratories, seminar rooms, library facility, students' amenities and all the appurtenant requirements to carry out teaching activity effectively.

APPOINTMENT OF TEACHING AND SUPPORTING STAFF:
The appointment of teaching staff shall be done as per the norms laid down by AICTE and other statutory bodies as applicable.

RULES OF COURSE STRUCTURE FOR MASTER OF ARCHITECTURE.

M.ARCH. (COMPUTER APPLICATIONS)

<u>**RULE NO. 1 : ELIGIBILITY CRITERIA**</u>

A student seeking admission to Master of Architecture Course must have secured minimum 50% marks in aggregate in a Bachelor of Architecture degree course or equivalent courses recognized by the apex body with / without valid GATE score. The students with valid GATE score shall be given preference and the students without GATE score shall be considered subject to the vacancy.

<u>**RULE NO. 2 : SCHEME OF ASSESSMENT:**</u>

A candidate to be eligible for the Masters Degree in Architecture will be required to appear for and pass examinations as under

1. First Year M. Arch: SEM I AND SEM II
2. Second Year M. Arch. :   SEM II AND SEM IV

University will declare combined result of
* SEM I + SEM II at the end of First Year and
* SEM III + SEM IV at the end of Second Year

<u>**RULE NO. 3 : GRANTING OF TERM**</u>

Academic year will consist of TWO SEMESTERS of 90 teaching days each. Sessional work/ assignments prepared by the students shall be continuously assessed by the Internal Teacher throughout the semester.
The candidate will be permitted to appear for the examinations at the end of each semester only if he/she keeps term at a college affiliated to the university and produces testimonials from the Principal for
1. 75% attendance in each head of passing of Theory and /or Sessional work as prescribed by the University.
2. Satisfactory completion of the Sessional Work prescribed for each subject and secured at least 50 % marks in the Internal Assessment for the same.
3. Good conduct.

<u>**RULE NO.4 : EXAMINATIONS**</u>

At each examinations Theory Paper Sessional and Sessional and viva – voce based on Sessional Work, as prescribed in the syllabus for the Examination at the end of each semester, shall constitute separate heads of passing.

RULE NO. 5 : SESSIONAL WORK ASSESSMENT:

a) In respect of Sessional work in First , Second, Third and Fourth semesters, target date shall be fixed for the completion of each assignment. All assignments shall be continuously assessed by the Internal Teacher during each semester.
b) For the Fist, Second, and Third Semester examinations, Sessional and Viva assessment will be done by an External Examiner, who is external to the college i.e. teacher from college other than one, whose students are being examined.
c) For Fourth Semeter examination, external assessment shall be carried out by a professional not teaching in any of the Colleges under University of Pune.
d) An examiner for any of the subjects of examination shall have a minimum of 5 years of teaching/professional experience in his/her specific field of study.

RULE NO. 6: PRE REQUISITES AND RULES OF A.T.K.T. FOR ADMISSION TO HIGHER CLASSES
This course has been considered as an integrated on and students will be allowed to take admission to second, third and fourth semesters irrespective of number of subjects in which they are failing.

RULE NO. 7 : CRITERIA FOR PASSING

To pass the First and Second Year Examination, a candidate must obtain minimum 50 % marks in each paper, 50% in Sessional/Viva voce and 50% in aggregate.

RULE NO. 8 : GRADING SYSTEM

THE CLASS FOR THE DEGREE SHALL BE AWARDED TO THE STUDENT ON THE AGGREGATE MARKS OBTAINED BY HIM IN FIRST AND SECOND YEAR TAKEN TOGETHER.

The award of class shall be as follows.
    a) Aggregate 66% or more: First Class with Distinction.
    b) Aggregate 60% or more but less than 66% marks: First Class
    c) Aggregate 55% or more but less than 60% marks: Higher Second Class
    d) Aggregate 50% or more but less than 55% marks: Second Class

RULE NO. 9 : EXEMPTIONS AND SUPPLEMENTARY EXAMINATION

In case a candidate fails and desires to appear again,
    a) He/she will be exempted from appearing in the head/s of passing in which he/she has passed
    b) A candidate will have to appear for the examination of backlog subjects along with the examination of current semester.

RULE NO. 10 : OTHER RULES:

University / affiliated colleges may frame additional rules and regulations or modify these regulations if required, and once approved by the University, they would be binding on the students.

PROPOSED

COURSE STRUCTURE

FOR

M. ARCH.
(COMPUTER APPLICATIONS)

NAME OF COURSE :MASTER OF ARCHITECTURE

M. ARCH (COMPUTER APPLICATIONS)

(Course structure)

FIRST YEAR

SEMESTER I

Subject code	Name of subject	Teaching scheme Contact periods of 45 minutes each			Examination scheme						
		Lecture	Studio	Total	Paper	Sessional		Oral/Viva		Total Marks	Credits
						Int.	Ext	Int.	Ext		
613401	Introduction to Computer Applications in **G.I.S., Building Automation, Management Information System & Computer Visualization**	3	1	4	75	25	---	---	---	100	2
613402	Human Computer Interface	3	1	4	75	25	---	---	---	100	2
613403	Fundamentals of Computer Graphics	3	1	4	75	25	---	---	---	100	2
613404	Theory of Digital Architecture- I	3	1	4	75	25	---	---	---	100	2
613405	Colloquium- I	---	4	4	---	100	---	---	---	100	2
613406	Digital Design Studies (Studio)- I	2	8	10	---	100	100	25	25	250	5
	Total	14	16	30	300	400		50		750	15
	TOTAL OF SEM I			**30**							**750**

SEMESTER II

Subject code	Name of subject	Teaching scheme Contact periods of 45 minutes each			Examination scheme						
		Lecture	Studio	Total	Paper	Sessional		Oral/Viva		Total Marks	Credits
						Int.	Ext	Int.	Ext		
613406	Digital Communication and Multimedia Systems	3	1	4	75	25	---	---	---	100	2
613408	Architectural Visualization	3	1	4	75	25	---	---	---	100	2
613409	Theory of Digital Architecture - II	3	1	4	75	25	---	---	---	100	2
613410	Automated Services	1	3	4	---	100	---	---	---	100	2
613411	Colloquium- II	---	4	4	---	100	---	---	---	100	2
613412	Digital Design Studies (Studio) - II	2	8	10	---	100	100	25	25	250	5
	Total	12	18	30	225	475		50		750	15
	TOTAL OF SEM I			**30**							**750**

NAME OF COURSE :MASTER OF ARCHITECTURE
M. ARCH (COMPUTER APPLICATIONS)
(Course structure)

SECOND YEAR

SEMESTER III

Subject code	Name of subject	Teaching scheme Contact periods of 45 minutes each			Examination scheme						
		Lecture	Studio	Total	Paper	Sessional		Oral/Viva		Total Marks	Credits
						Int.	Ext	Int.	Ext		
713401	Introduction to Programming	3	1	4	75	25	---	---	---	100	2
713402	GIS & Remote Sensing	3	1	4	75	25	---	---	---	100	2
713403	Advance Software Development Tools	1	3	4	---	50	50	---	---	100	2
713404	Elective • Virtual Reality Modeling Language • CAD management	1	3	4	---	100	---	---	---	100	2
713405	Research Methodology and paper	1	3	4	---	50	50	---	---	100	2
713406	Digital Design Project (Studio) III	2	8	10	---	100	100	25	25	250	5
	Total	11	19	30	150	550		50		750	15
	TOTAL OF SEM I			30							750

SEMESTER IV

Subject code	Name of subject	Teaching scheme Contact periods of 45 minutes each			Examination scheme						
		Lecture	Studio	Total	Paper	Sessional		Oral/Viva		Total Marks	Credits
						Int.	Ext	Int.	Ext		
713407	Professional Training	---	---	4	---	50	---	50	---	100	2
713408	Dissertation (Thesis)	6	20	26	---	300	300	25	25	650	13
	Total	6	20	30	---	650		100		750	15
	TOTAL OF SEM I			30							750

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MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA101 - INTRODUCTION TO COMPUTER APPLICATIONS

TEACHING SCHEME
Lectures: 3
Studios : 1

EXAMINATION SCHEME
Paper: 75
Sessional Internal: 25
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

Introduction to various aspects of computer applications into Architectural Design and Construction. Opening up horizons of technical advances and advantages of computational technologies through the use of computer modeling, rendering and digital fabrication. Focus on the exploration of space and place making through the use of computer modeling and design construction.

COURSE OUTLINE:

Each of the below mentioned topics shall be introduced in lecture periods, and is to be dealt with, subsequently in the design studios in detail. The focus of teaching in this subject shall be on the below mentioned units.

Unit I: Introduction: Basic introduction to the use of computer applications in the field of Architecture and Building Design. Various possibilities and emerging fields.

(No. of lectures: 04)

Unit II: Computer Visualization: Basic introduction of concepts of visualization, like 3D modeling, parametric modeling, animation, Virtual Reality, presentation techniques, etc.

(No. of lectures: 16)

Unit III: Building Automation Systems: Introduction of various concepts like Automation in acoustical design, illumination, water supply, fire-fighting, HVAC, emergency systems, etc.

(No. of lectures: 16)

Unit IV: GIS & Mapping: Introduction of Geographic Information Systems and various tools available, uses of GIS in different fields, etc.

(No. of lectures: 16)

Unit V: Management Information Systems: Introduction of MIS and its uses in the building industry, for example in construction management, data management, etc.

(No. of lectures: 16)

Unit VI: Conclusion seminar: Revision of all the topics in discussion format.

(No. of lectures: 04)

RECOMMENDED READINGS:

1. Practical guide to computer applications for architecture and design by David Kent Ballast, Publisher: Prentice-Hall (1986) ISBN: 0136906869
2. Computer Applications in Architecture (Architectural Science Series) by John S. Gero (Other Contributor) Publisher: Applied Science Publishers Ltd. (January, 1977) ISBN: 0853347379
3. Bibliography: computer applications to architecture by Kelly R McAdams
4. Computer-Integrated Building Design by Tim Cornick, Publisher: E & FN Spon; 1st ed edition (January 1, 1996) ISBN: 0419195904

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA102 - HUMAN COMPUTER INTERFACE

TEACHING SCHEME
Lectures: 3
Studios : 1

EXAMINATION SCHEME
Paper: 75 marks
Sessional Internal: 25 marks
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

Issues dealing with Information Systems and Human Psychology, similarities and differences, Importance of human factor and paradigms of interaction.

COURSE OUTLINE:

Unit I: Introduction: The Human- I/P, O/P channels, Human memory, Thinking, Emotion, Individual differences (diversity), Human psychology.
(No. of lectures: 08)

Unit II: Principles of models and guidelines
- o Principle 1: Recognize diversity
- o Principle 2: 8 golden rules of id
- o Principle 3: Prevent errors
  - ▪ Guidelines for data display, Guidelines for data entry, Study of HCI patterns
  - ▪ Models: Types of models, cognitive models, GOMS and keystroke-level model, stages of action models, linguistic models, BNF and task action grammar, object action interface model
(No. of lectures: 12)

Unit III: Design Process: The process of design, user focus, aims of user entered design process, three pillars of design, participatory design, scenarios, navigation design, screen design, development methodology. s/w tools: design tools, and s/w engineering tools. (No. of lectures: 20)

Unit IV: Direct manipulation systems: visual thinking and locus, virtual environment organization, item representation sequence, menu layout, form-filling, dialog design notions
- • Usability: Introduction, usability, testing and evaluation techniques, expert reviews, acceptance tests
- • Implementation support: support, training and learning, requirements of user support elements of windowing systems, individual windowing design, multiple windowing design, command organization strategies, command menus, natural languages in computers
(No. of lectures: 20)

Unit V: Documentation and social issues: Documentation: CSCW & Web: Presentation styles-error messages, printed manuals, online facilities, CSCW: Groupware, Goals of cooperation, Asynchronous interaction, application to social issues, Hypermedia: Users and their tasks, O-AI model for web site designing

(No. of lectures: 08)

Unit VI: Miscellaneous: Case studies, web embedded reformation visualization interactive devices, social acceptability and organizational usage.

(No. of lectures: 04)

RECOMMENDED READINGS:

1. "Human Computer Interaction", by Alan J. Dix, Janet Finlay, Russell Beale, Pearson Education, 3rd Edition, 2004
2. "Designing the User Interface", by Ben Shneiderman, Pearson Education, 2001
3. "Human Computer factors: A study of users and Information Systems", by Andy Smith, McGraw Hill, 1997
4. "The essentials of Interaction Design", by Alan Cooper, John Wiley, 2003

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA103 – FUNDAMENTALS OF COMPUTER GRAPHICS

TEACHING SCHEME
Lectures: 3
Studios: 1

EXAMINATION SCHEME
Paper: 75
Sessional Internal: 25
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

This course aims at giving emphasis on the fundamentals of Graphics, and the concepts, so as to make this course NOT "Package based", but, "Concept based" course.

COURSE OUTLINE:

Unit I: Basic concepts: Introduction to computer graphics, Types of graphics devices, Display file structure, Display file interpreter, Display processors, Graphics file format, BMP,TIFF, PCX, GIF, etc.
- Line, circle and polygon generation:
  - line generation- DDA and Bresenham's algorithm, thick line segments, Antialising of lines,
  - circle generation: DDA and Bresenham's algorithm,
  - character generation: stroke principle, starburst principle, bit map method.

(No. of lectures: 12)

Unit II: Polygons: types, representations, entering polygons, and polygon filling: seed fill, edge fill, scan conversion algorithm.
- Scan conversion: real time scan conversion, solid area scan conversion, run length encoding, cell encoding segments: concepts, segment table, segment creation, deletion, renaming, image transformation.

- 3D geometry: 2D transformations primitives and concepts- translation, rotation, Rotation about an arbitrary points, Scaling and shearing, 3D transformations, Rotation about an arbitrary axis, 3D viewing transformations, Concept of parallel and perspective projections, Viewing parameters, 3D clipping, Mid-point subdivision algorithm.

(No. of lectures: 14)

Unit III: Windowing and clipping: Viewing transformation, 2D clipping algorithm, Midpoint subdivision algorithm generalized clipping, Cyrus-Beck algorithm, Interior and exterior clipping, Polygon clipping, Sutherland-Hodgman algorithm.
- Hidden surfaces and lines: Back face removal algorithm, Hidden line methods, Z buffer, Warnock and painters algorithm, Floating Horizon.

(No. of lectures: 14)

Unit IV: Light, colour and shading: Diffused illumination, Point source illumination, Shading algorithm, Colour models RGB, HVS, CYM etc., Shading algorithm, Eliminating back spaces, Transparency, Reflection and shadows.

- Curves and fractals: Curve generation, Interpolation, Interpolating algorithms, Interpolating polygons, B-splines and corners, Bezier curves, Fractals, Fractal surfaces and lines

(No. of lectures: 14)

Unit V: Interactive graphics: Graphics astandards, graphics hardware, CRT display and controller, interlaced and non-interlaced display, vector scan and raster scan, display adapter, VGA, SVGA, BIOS Video support, Graphics device drivers, display buffers, study of Graphics stations (Practical aspects). Plotters, Digitizers, Scanners, Lightpen, etc. (No. of lectures: 10)

Unit VI: Graphics Standard: Introduction to Graphics kernel system with Basic primitives

- Graphics Applications: Scientific and Engg. Application, Business application, application concept in animation and simulation

(No. of lectures: 08)

RECOMMENDED READINGS:

1. Procedural Elements for Computer Graphics: David F. Rogers, McGraw Hill International Editions
2. Computer Graphics- A programming approach: McGraw Hill International Editions
3. Computer Graphics, Principles and Practice: Foley, Vandam, Feiner, Hughes, Addison Wesley
4. Architectural Representation Handbook: Traditional and Digital Techniques for Graphic Communication by Paul Laseau
5. Demonstrating Digital Architecture: 2004 Feidad Award by Yu-Tung Liu (Editor)

MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA 104 – THEORY OF DEGITAL ARCHITECTURE - I

TEACHING SCHEME
Lectures: 3
Studios : 1

EXAMINATION SCHEME
Paper: 75
Sessional Internal: 25
Sessional External: NIL
Viva-voce: NIL

Course Objective:

Computers are becoming an integrated part of our everyday life. This course aims at discussing issues of Architectural Interpretations in the contexts of culture and socio-economics with a backdrop of emerging Computer Technology.

Course Outline:

The focus of teaching shall be on
A. Emerging Computer Technologies
B. Changing Cultures of the world due to technological innovations
C. Architectural Interpretations
D. Other Theoretical issues like globalization, local contexts etc.

Sessional Work:

Study material shall be given a week in advance for every module. Students will write one paper after discussion on every module, expressing their own opinion. They will participate actively during the lecture period.

Recommended Readings:

1. Rethinking Architecture: A Reader in Cultural Theory by Neil Leach
2. Architecture Culture: 1943-1968 (Columbia Books of Architecture) by Joan Ockman
3. Architecture Theory since 1968 by K. Michael Hays (Editor)
4. Louis Kahn: Essential Texts by Louis I. Kahn,
5. Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995 by Kate Nesbitt
6. Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture by Kenneth Frampton

7. Robert Venturi: Complexity and Contradiction in Architecture by Robert Venturi
8. Practice: Architecture, Technique and Representation (Critical Voices in Art, Theory, and Culture) by Stan Allen
9. Supermodernism: Architecture in the Age of Globalization by Hans Ibelings (Paperback)
10. Theories and Manifestoes of Contemporary Architecture by Charles Jencks (Editor), Karl Kropf (Editor)
11. Proportion: Science, Philosophy, Architecture by Richard Padovan
12. The Paradox of Contemporary Architecture by Peter Cook (Editor), et al
13. Vitruvius: Ten Books on Architecture by Vitruvius, et al
14. The Architecture of the Jumping Universe: A Polemic : How Complexity Science Is Changing Architecture and Culture by Charles Jencks
15. The Writing on the Walls (Architectural Press Monographs) by Anthony Vidler
16. Ontology of Construction: On Nihilism of Technology and Theories of Modern Architecture by Kenneth Frampton (Foreword), Gevork Hartoonian (Paperback - March 28, 1997)
17. Chora Four: Intervals in the Philosophy of Architecture by Alberto Perez-Gomez (Editor), Stephen Parcell (Editor)
18. Intersections: Architectural Histories and Critical Theories by Iain Borden, Jane Rendell
19. A History of Architectural Theory: From Vitruvius to the Present by Hanno-Walter Kruft

MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA105 - COLLOQUIUM - I

TEACHING SCHEME

Lectures: NIL

Studios: 4

EXAMINATION SCHEME

Paper: NIL

Sessional Internal: 100

Sessional External: NIL

Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

In the field of emerging technologies like digital media and applications, it is essential for one to have global perspective, of what has already been done and what is going on around the world. It is difficult for one to know everything in a short time. This format of the course helps do that to a certain extent. Students shall do an extensive research on pioneers of this field and make audio-visual presentation in front of the class. They will be followed by extensive discussions guided by the faculty member/s. These presentations aim to be beneficial for all the students. Faculty shall provide the guidance on the topics and research methods.

COURSE OUTLINE:

The focus shall be on the specific research works/papers/projects in the field of Digital Design Media, by eminent personalities: such as Digital Design Studio by William Mitchell, Virtual Reality Cave of Lasscaux by Benjamin Britton, Hyperbodies by Kas Oosterhuis, FORM by Gregg Lynn, etc.

Unit I: Introduction of the colloquium format. Research on potential topics, through books, magazines, internet and other resources.   (No. of periods: 04)

Unit II: Choosing the topics and preparing for the colloquium presentation
                                                          (No. of periods: 12)
Unit III: Colloquium presentations in Audio-Visual format. A paper to be distributed before beginning the presentation, which is to be discussed after the presentation.
                                                          (No. of periods: 32)

Unit IV: Discussion on the presented topics   (No. of periods: 12)

Unit V: Writing papers on the presented and discussed topics. Personal views to be elaborated and discussed in the paper.   (No. of periods: 08)

Unit VI: Conclusion by the faculty member   (No. of periods: 04)

SESSIONAL WORK / VIVA:

The sessional work shall be assessed by the internal faculty member, on the basis of A/V presentation. Audio-Visual presentation shall be made by the students in a group of two/three. It shall be of about one-hour length and shall be followed by a group

discussion. The viva shall be conducted based on the papers written by a student, describing his/her views on the group-discussions taken place, after each of the A/V presentation.

RECOMMENDED READINGS:

1. Hybrid Space : Generative Form and Digital Architecture by PETER ZELLNER
2. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu
3. Next Generation Architecture : Folds, Blobs, and Boxes by JOSEPH ROSA
4. Advanced Technologies : Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi
5. Hyperbodies by Kas Oosterhuis
6. Digital Tectonics by Neil Leach (Editor), David Turnbull (Editor), Chris Williams (Editor)
7. Digital Design Studio by Willliam Mitchell

SEMESTER I

CA106- DIGITAL DESIGN STUDIES –LEVEL 1

TEACHING SCHEME
Lectures: 2
Studios : 8

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 200
Sessional External: 200
Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

Objective of this studio is to introduce the integration of Visualization tools and MIS Tools with Architectural Design Datasets.

COURSE OUTLINE:

Students will take up two independent design projects during the course of this semester, in a group of four. The project shall be specifically designed and approved by the faculty, to fulfill the objectives. The scope of the project should be limited to a small office building, industrial building, shopping mall, or such small project. The source of this may be an existing Architectural project, onto which the Visualization and Building Automation tools could be integrated and redefined in two separate projects. One project shall go on for no longer than 8 weeks.

Unit I: Introduction of the first project:	(No. of lectures: 12)
Unit II: Using Visualization tools on the given project	(No. of lectures: 80)
Unit III: Presentation of the project	(No. of lectures: 16)
Unit IV: Introduction of the second project	(No. of lectures: 12)
Unit V: Using Building Automation tools on the given project	(No. of lectures: 80)
Unit VI: Presentation of the project	(No. of lectures: 16)

SESSIONAL WORK / VIVA:

This shall be a group-work, distributing specific duties to each of the member. Each student shall be judged on individual performance as well as his/her contribution to the group work.

RECOMMENDED READINGS:

1. Ruck, Nancy, C. 1989, Building Design and Human performance, Van Nostrand Rheingold
2. Hartkopf, Volk, [et al], (1993), Designing the office for the future: the   Japanese approach to tomorrows workplace, John Wiley & sons

3. Ronald N. Helms and M. Clay Belcher , Lighting for energy efficient luminous environments.
4. Design with Light- A lighting handbook by Anil Valia
5. Philips Lighting correspondence course- Lighting design and application center.
6. ASHRAE Journals (for HVAC)
7. Heating Ventilation and Air Conditioning, McQuiston and Parker
8. Modern heating, Ventilation and Air-conditioning, by George Clifford
9. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu

SEMESTER II

CA207 - DIGITAL COMMUNICATION AND MULTIMEDIA SYSTEMS

TEACHING SCHEME   **EXAMINATION SCHEME**
Lectures: 3   **Paper: 75**
Studios : 1   **Sessional Internal: 25**
                                       Sessional External: NIL
                                       Viva-voce:NIL

COURSE OBJECTIVE AND PREREQUISITES:

The speed of digital communication is increasing by the day and advances in multimedia technologies play a big role in the communication system. Objective of this course is to introduce various aspects of multimedia technologies and familiarize them with the practical and theoretical issues.

COURSE OUTLINE:

This course shall be mainly in a form of series of lectures and practical demonstrations.

Unit I: Introduction: Overview, building blocks, standards, multimedia and internet, applications, Data representation, transmission, modes of data transmission, encoding frequency spectrum, transmission channel, synchronous and asynchronous communication, simplex, half duplex and full duplex transmission. Networks and services, switching methods, circuit, packet and message switching. (No. of lectures: 12)

Unit II: Audio: Use of audio in computer applications, basic concepts, capture, digital representation of sound and processing music, speech, file formats for sound, streaming. (No. of lectures: 12)

Unit III: Video /Image: Analogue and Digital video image, Video capture and processing, Colour models, Colour model transformations, Colour video and its formats, NTSC, PAL, and SECAM, DVI, SDI, streaming. (No. of lectures: 12)

Unit IV: Text and Animation: Text in multimedia, hypertext, hypermedia, Principle of animation, 2D, 3D animation (No. of lectures: 12)

Unit V: Multimedia devices: Mass storage systems for multimedia requirements, device control, Magnetic devices, Hard disks, Pen drives, Optical devices, CDROM, DVD, Scanners. (No. of lectures: 12)

Unit VI: Programming for multimedia applications: Function calls, API, Support from Unix, Linux, and Windows, Composition, Synchronization, multimedia on the web. (No. of lectures: 12)

RECOMMENDED READINGS:

1. Ralf Stainntetz, Katra Nahrstedt, Multimedia Computing, communications and application, Pearson Education Services.
2. Roy a Plastock, Gorden Kalley: Computer Graphics, McGraw Hill
3. John I Koegel Buford: Multimedia system, ACM Press 2000
4. J. D. Foley, A. Van Dam: "Fundamental of Interactive Computer Graphics", Addition Wesley year, addition.

SEMESTER II

CA208 - ARCHITECTURAL VISUALIZATION

TEACHING SCHEME	EXAMINATION SCHEME
Lectures: 3	**Paper: 75**
Studios : 1	**Sessional Internal: 25**
	Sessional External: NIL
	Viva-voce: NIL

COURSE OBJECTIVE AND PREREQUISITES:

Specific issues dealing with form generation using the generative potential of software's unique ability to deploy geometric entities. Introduction of Shape grammars, 3D sketch boards, parametric design tools, virtual environments etc. Discussion of Visualization techniques and their potential uses for the Architectural Design and analysis.

COURSE OUTLINE:

Unit I: Introduction to Virtual environments, Alpha worlds, Digital design studio concept by William Mitchell   (No. of lectures: 12)

Unit II: Immersive and non-immersive environments, generation techniques, software components.   (No. of lectures: 12)

Unit III: Introduction to Hardware components such as data-gloves, Head Mounted Displays, IMAX screens, virtual cave etc.   (No. of lectures: 12)

Unit IV: Shape grammars for form generation: Visual and spatial reasoning in Design. Introduction of features found in typical 2D & 3D shape grammars. References used in conjunction with tabular shape grammar summaries such as those for DXF, IGES, RIB, and VRML.   (No. of lectures: 12)

Unit V: Digital tectonics, Morphogenetic design strategies, Reflexive architecture, Hybrid spaces.   `   (No. of lectures: 12)

Unit VI: Other related issues: Contemporary Digital Experimentation and the Radical Avant-garde.   (No. of lectures: 12)

RECOMMENDED READINGS:

1. HyperArchitecture : Spaces in the Electronic Age (The Information Technology Revolution in Architecture) by Luigi Prestinenza Puglisi, L. Byatt (Translator)
2. Next Generation Architecture : Folds, Blobs, and Boxes by JOSEPH ROSA
3. Advanced Technologies : Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi

4. Hyperbodies by Kas Oosterhuis
5. Digital Tectonics by Neil Leach (Editor), David Turnbull (Editor), Chris Williams (Editor)
6. Hybrid Space : Generative Form and Digital Architecture by PETER ZELLNER
7. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu
8. Architectural Representation Handbook: Traditional and Digital Techniques for Graphic Communication by Paul Laseau

SEMESTER II

CA209 THEORY OF DIGITAL ARCHITECTURE - II

TEACHING SCHEME   **EXAMINATION SCHEME**
Lectures: 3   **Paper: 75**
Studios : 1   **Sessional Internal: 25**
                      Sessional External: NIL
                      Viva-voce: NIL

Course Objectives:

    Specific theoretical issues dealing with form generation using the generative potential of software's unique ability to deploy geometric entities. Introduction of Shape grammars and its potential uses for the Architectural Design and analysis.

Course Outline:

    The focus of teaching shall be on
    A. Virtual environments
    B. 3D sketch-boards
    C. Shape grammars
    D. Other similar theoretical issues

Sessional Work:

    The sessional work shall be in form of the experiments with above mentioned topics and research papers based on those experiments.

Recommended Readings:

8. HyperArchitecture : Spaces in the Electronic Age (The Information Technology Revolution in Architecture) by Luigi Prestinenza Puglisi, L. Byatt (Translator)
9. Animate Form by Greg Lynn
10. Next Generation Architecture : Folds, Blobs, and Boxes by JOSEPH ROSA
11. Advanced Technologies : Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi
12. Hyperbodies by Kas Oosterhuis
13. Digital Tectonics by Neil Leach (Editor), David Turnbull (Editor), Chris Williams (Editor)
14. Blobitecture: Waveform Architecture and Digital Design by John K. Waters

15. Next Generation Architecture : Folds, Blobs, and Boxes by JOSEPH ROSA
16. CAD Principles of Design, An Analytical Approach to the Computational Representation of Architectural Form by Peter Szalapaj
17. Hybrid Space : Generative Form and Digital Architecture by PETER ZELLNER
18. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu
19. Defining Digital Architecture: 2001 FEIDAD Award by Yu Tung Liu (Editor)
20. Digital Architecture by M. Saleh Uddin
21. New Flatness : Surface Tension in Digital Architecture by Alicia Imperiale
22. Architectural Representation Handbook: Traditional and Digital Techniques for Graphic Communication by Paul Laseau
23. Digital Gehry by Bruce Lindsey
24. Demonstrating Digital Architecture: 2004 Feidad Award by Yu-Tung Liu (Editor)
25. Digital Eisenman (The Information Technology Revolution in Architecture)
    by Luca Galofaro, Luca Galofaro (Translator)

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER I

CA210 AUTOMATED SERVICES

TEACHING SCHEME
Lectures: 1
Studios : 3

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 100
Sessional External: NIL
Viva-voce: NIL

Course Objective:

Detail study of Building Automation for building types like residential complexes, commercial & public buildings, specialized buildings etc.

Applicability of systems and specialized devices for/in
A. HVAC
B. Emergency services
C. Water supply
D. Security
E. Day today applications
F. Building maintenance

Sessional Work:

Students will identify problems with respect to each building type and provide a complete solution by using prevalent systems and devices to aid the building management.

Recommended Readings:

1. Building Automation and Controls by W.S.Ottawa
2. Home Automation and wiring – James Gerhart
3. L. Cremer and H. Muller (trns schults). Principles and applications of room acoustics (vol 1) applied science 1982
4. Fry et al. Noise control in building services. Pergammon Press 1988
5. Building Control Systems by Vaughn Bradshaw
6. Lighting Design + Applicatiob Published by IESNA (Illumination Engineering Society)
7. Applied Illumination Engineering by L.Lindsey. FIES
8. Ronald N.Helms and M.Clay Belcher lighting for energy efficient luminous environments.Heat and Mass Transfer Author: Dr.M.K.Murlidhara

9. ASHRAE Journals
10. Modern Heating, Ventilation and Air-Conditioning by George Clifford
11. Principles of Refrigeration by Roy Dossat
12. Solar passive buildings: Science and design Authors: Shoba, Bansal, Malik
13. Solar Concepts in buildings and planning CBRI, Rourkee
14. Solar Energy in Architecture and Urban Planning by Thomas Herzog

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER II

CA211 COLLOQUIUM - II

TEACHING SCHEME
Lectures: NIL
Studios : 4

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 100
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

In the field of emerging technologies like digital media and applications, it is essential for one to have global perspective, of what has already been done and what is going on around the world. It is difficult for one to know everything in a short time. This format of the course helps do that to a certain extent. Students shall do an extensive research on emerging technological discoveries of this field and make audio-visual presentation in front of the class. They will be followed by extensive discussions guided by the faculty member/s. These presentations aim to be beneficial for all the students. Faculty shall provide the guidance on the topics and research methods.

This is in continuation of Colloquium-I. The objective of this course shall be to do extensive research on latest technical advancements in the field of digital technologies and their related applications.

COURSE OUTLINE:

The focus of teaching shall be on the latest technical advancements in the field of "digital design and architecture" and their practical and/or theoretical applications. The technical advancements could be such as Digital design studio concept, Parametric design tools, 3D sketch boards, Blobitecture- Waveform Architecture etc.

Unit I: Introduction of the colloquium format. Research on potential topics through books, magazines, internet and other resources   (No. of periods: 04)

Unit II: Choosing the topics and preparing for the colloquium presentation
                                                                     (No. of periods: 12)

Unit III: Collouium presentations   (No. of periods: 32)

Unit IV: Discussion on the presented topics   (No. of periods: 12)

Unit V: Writing papers, elaborating on the personal views on the presented topics
                                                                     (No. of periods: 08)

Unit VI: Conclusion by the faculty member   (No. of periods: 04)

SESSIONAL WORK / VIVA:

The sessional work shall be assessed by the internal faculty member, on the basis of A/V presentation. Audio-Visual presentation shall be presented by the students in a group of two/three. It shall be of about one-hour length and shall be followed by a group discussion. The viva shall be conducted based on the papers written by a student, describing his/her views on the group-discussions taken place, after each of the A/V presentation.

RECOMMENDED READINGS:

1. HyperArchitecture : Spaces in the Electronic Age (The Information Technology Revolution in Architecture) by Luigi Prestinenza Puglisi, L. Byatt (Translator)
2. Advanced Technologies : Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi
3. Hyperbodies by Kas Oosterhuis
4. Digital Tectonics by Neil Leach (Editor), David Turnbull (Editor), Chris Williams (Editor)
5. Next Generation Architecture : Folds, Blobs, and Boxes by JOSEPH ROSA
6. Hybrid Space : Generative Form and Digital Architecture by PETER ZELLNER
7. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER II

CA212- DIGITAL DESIGN STUDIES – LEVEL 2

TEACHING SCHEME
Lectures: 2
Studios : 8

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 200
Sessional External: 200
Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

Objective of this studio is to introduce integration of Management Information Systems and Geographical Information Systems and Mapping Tools with Architectural Design Datasets.

COURSE OUTLINE:

Students will take up two independent design projects, in a group of four, specifically designed to fulfill the requirement for integration of above-mentioned specializations. The scope of the project should be limited to a small office building, industrial building, shopping mall, or such small project. The source of this may be an existing Architectural project, onto which the MIS and GIS tools could be integrated and redefined.

Unit I: Introduction of the first project:	(No. of lectures: 12)
Unit II: Using GIS tools on the given project	(No. of lectures: 80)
Unit III: Presentation of the project	(No. of lectures: 16)
Unit IV: Introduction of the second project	(No. of lectures: 12)
Unit V: Using Building MIS on the given project	(No. of lectures: 80)
Unit VI: Presentation of the project	(No. of lectures: 16)

SESSIONAL WORK:

This shall be a group-work, distributing specific duties to each of the member. Each student shall be judged on individual performance as well as his/her contribution to the group work.

RECOMMENDED READINGS:

1. DBMS by Date
2. Fundamentals of Database Systems by Remez Elmasri, Shamkant B. Navathe
3. Building Control Systems by Vaughn Bradshaw
4. Modern Control Engineering by Katsuhilo Ogata, University of Minnesota
5. Berry John, 1995, Integrated design-building Services
6. Atkin, Brian, 1993, Intelligent Buildings: Applications of IT and building automation to high technology construction projects, Aldershot: Avebury Technical

7. M Anji Reddi, " Remote sensing & Geographical Information Systems ",BS Publication, Second Edition.
8. George B. Korte, " The GIS Book ", Onword Press (Thomson learning), 5th Edition.
9. Peter A. Burrough and McDonell, "Principles of Geographical Information Systems ", Oxford University Press, 1998.

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER III

CA313- INTRODUCTION TO PROGRAMMING

TEACHING SCHEME
Lectures: 3
Studios : 1

EXAMINATION SCHEME
Paper: 75
Sessional Internal: 25
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

The main objective of this course is to introduce basic level programming to the students. They may be introduced to the various programming languages.

COURSE OUTLINE:

The focus of teaching shall be on basic fundamental concepts of programming in various languages like C, C++, Java, Visual Basic, etc. The students are expected to be able to write small programmes in individual capacity at the end of this course.

Unit I: Introduction about software,
- What is programming
- What is Software
- Basic category of software

(No. of periods: 04)

Unit II: Introduction to C,
- Basic Variables
- Datatypes, arrays, Function, Springs
- Decision Control structure, switch ---case
- Exercises/Assignments: 2 to 3 nos like finding even and odd numbers

(No. of periods: 16)

Unit III: Introduction to C++
- Basics of C++
- What is Object Oriented Programming
- Difference between C and C++
- C++ Basic concepts
- Inheritance, Exception Handling, Templates
- Polymorphism
- Exercises/ Assignments: 2 to 3 nos like Creating network diagram, CPM & PERT structures

(No. of periods: 16)

Unit IV: Visual Basic:
- Introduction to Visual Basic
- Forms
- Different Components in VB
- Data base and data types in VB
- Exercises and Assignments: 2 to 3 nos like Ara Calculation chart and Quantity Calculation chart

(No. of periods: 16)

Unit V: JAVA, Core JAVA
- Basic concepts of JAVa
- How to run JAVA programming
- Different components in JAVA
- Database and Datatype in JAVA
- Exercises and Assignments: 2 to 3 nos like Ara Calculation chart and Quantity Calculation chart

(No. of periods: 16)

Unit VI: Conclusion and relevance in Architectural Applications

(No. of periods: 04)

RECOMMENDED READINGS:

1. Concepts in Programming Languages by John C. Mitchell, Krzysztof Apt Publisher: Cambridge University Press; 1st edition , ISBN: 0521780985
2. Let us C by Yashwant Kanitkar
3. Let us C++ by Yashwant Kanitkar
4. Complete Reference JAVA
5. Complete Reference VB

SEMESTER III

CA314- GIS AND REMOTE SENSING

TEACHING SCHEME
Lectures: 3
Studios : 1

EXAMINATION SCHEME
Paper: 75
Sessional Internal: 25
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

The main objective of this course is obtaining the basic knowledge of GIS and Remote Sensing fundamentals and its relevance to Architectural design and development.

COURSE OUTLINE:

Unit I: Map Language: Map as a model, classification of maps, spatial referencing system, map projections, commonly used map projections, grid systems, computer map production
- digital database in a GIS, linkage of GIS to remote sensing
- Remote sensing- Basic principles: Electromagnetic remote sensing, energy sources, atmospheric interactions with electromagnetic radiations, energy interactions with Earth's surface materials.

(No. of lectures: 12)

Unit II: Microwave remote sensing: The Radar principle, Factors affecting microwave measurements, Radar wavebands, SLAR systems, Sar, Interpreting Sar images, Geometrical characteristics
- Remote sensing platform and sensors: satellite systems parameters, sensor parameters, imaging sensor systems, Earth Resources satellites, Meteorological Satellites, satellites carring Microwave sensors, OCEANSAT-1 (IRS-P4), IKONOS satellite series.

(No. of lectures: 12)

Unit III: Visual image interpretation: Types of pictorial data products, Image interpretation strategy, Image interpretation process, overview of image interpretation equipment.
- Digital image processing: Basic chapter of digital images, processing, registration, enhancement, spatial filtering, transformation, classification, image classification and GIS.

(No. of lectures: 12)

Unit IV: Fundamentals of GIS: Roots of GIS, Overview of information system, the four Ms, GIS definition and terminology, GIS queries, GIS architecture, Models of GIS, Framework for GIS, GIS categories, levels/scales of measurement.
- Spatial data modeling: Stages of GIS data modeling, Graphic representation of spatial data, raster GIS models, vector GIS models.

(No. of lectures: 12)

Unit V: GIS data management: Database management system, database models, storage of GIS data object based data models, temporal topology, organizational strategy of DBMS in GIS.

- Data input and editing: The data stream, data input models, data input methods, GPS for GIS data capture, data editing.
- Data quality issues: Components of data quality, accuracy, precision and resolution, consistency, completeness, source of error in GIS, GIS output, modeling errors and error evaluation.
- Data analysis and modeling: Format conversion, Data medium conversion, Spatial measurement methods, buffering techniques, overlay analysis, modeling surfaces, modeling networks.

(No. of lectures: 20)

Unit VI: Integration of remote sensing and GIS, Urban and Municipal Applications

(No. of lectures: 08)

RECOMMENDED READINGS:

2. M Anji Reddi, " Remote sensing & Geographical Information Systems ",BS Publication, Second Edition.
3. George B. Korte, " The GIS Book ", Onword Press (Thomson learning), 5th Edition.
4. Peter A. Burrough and McDonell, "Principles of Geographical Information Systems ", Oxford University Press, 1998.

MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER III

CA315- ADVANCE SOFTWARE DEVELOPMENT TOOLS

TEACHING SCHEME   **EXAMINATION SCHEME**
Lectures: 1   **Paper: NIL**
Studios : 3   **Sessional Internal: 50**
                                 Sessional External: 50
                                 Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

The primary objective of this course will be to introduce various software tools and their applications to the students, without going in too much details of each of the tools.

COURSE OUTLINE:

The focus of teaching shall be on introduction of software tools dealing with

Unit I: Advanced 2D & 3D modeling tools, rendering and animation tools, such as 3D studio MAX, Sketch up.   (No. of lectures: 16)

Unit II: Design-data management tools, parametric design tools, such as ArchiCAD, Revit etc.

(No. of lectures: 16)

Unit III: Management Information Systems tools, such as MS projects, MS VISIO.
(No. of lectures: 12)

Unit IV: Mapping and Geographic Information Systems tools, such as ArcView.
(No. of lectures: 16)

Unit V: Automation software tools, such as Energy plus, E-quest, and other open source software tools   (No. of lectures: 08)

Unit VI: Integration of the above-mentioned tools with one another
(No. of lectures: 4)

SESSIONAL WORK:

Seminars shall be presented by the students, for every module, demonstrating various tools, their strengths and weakness, and comparison with other tools.

RECOMMENDED READINGS:

1. Advanced Technologies: Building in the Computer Age (The Information Technology Revolution in Architecture) by Valerio Travi

SEMESTER III

CA316- INTER DISCIPLINARY ELECTIVE

TEACHING SCHEME   **EXAMINATION SCHEME**
Lectures: 1   **Paper: NIL**
Studios : 3   **Sessional Internal: 100**
                                       Sessional External: NIL
                                       Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

Each student will choose a subject of their interest, aiming towards their final project. They will be given extensive knowledgebase in form of lectures and project-studies.

COURSE OUTLINE:

The lectures to be arranged by the faculty for the given subjects, which are chosen by the students, followed by the discussions and written work. Each student shall choose one subject as an elective, among the offered subjects such as:

1. **Virtual Reality Modelling Language**

2. **CAD ManagementElective 1: Virtual Reality Modeling Languages**

    Unit I: Introduction to the Formats, such as VRML, X3D, MPEG4, and other
    formats   (No of periods: 12)

    Unit II: The VRML Consortium and ISO Standardization such as
    - VRML 97
    - Java 3D   (No of periods: 12)

    Unit III: Programming languages and editors for VRML, such as
    - VRMLpad
    - X-VRML
    - VRML ++   (No of periods: 12)

    Unit IV: Viewing and building VRML worlds
    - Optimization
    - Bump mapping,
    - Multitexturing   (No of periods: 48)

    Unit V: Cyberspace and Virtual communities,
    - Alpha Worlds,
    - Augmented Reality   (No of periods: 12)

    Unit VI: Uses of Virtual Reality for

- Gaming environments
- CAVE systems
- Product advertising
- Manufacturing Optimization
- Calculation results visualization
- Operative mission planning in civil protection with GIS
- Simulation
- Internet Communities   (No of periods: 12)

SESSIONAL WORK:

An individual project may be taken for individual studies. Various possible aspects to be accommodated and managed by the student. The scope of the project may be relatively small and pre-approved by the faculty member.

RECOMMENDED READINGS:
1. The VRML 2.0 Handbook by Jed Hartman, Josie Wernecke, and Silicon Graphics (Paperback - Oct 10, 1996)
2. Building Vrml Worlds by Claire Sanders, Charlie Scott, Paul Wolfe, and Sebastian Hassinger (Paperback - Dec 1996)
3. The Annotated VRML 2.0 Reference Manual by Rikk Carey and Gavin Bell (Paperback - Jun 6, 1997)
4. Reality Architecture: Building 3D Worlds In Java and VRML by Mccarthy and Carty (Paperback - Feb 5, 1998)
5. The Vrml Sourcebook by Andrea L. Ames, David R. Nadeau, and John L. Moreland (Paperback - Jan 1996)
6. Vrml: Browsing and Building Cyberspace by Mark Pesce (Paperback - Sep 1995)

Elective 2: CAD Management

Unit I: Introduction to CAD management   (No of periods: 06)

Unit II: Managing Data, Drawings, Images, emails and documents.
- Layer setup and
- Naming conventions   (No of periods: 18)

Unit III: Customization of CAD system, such as
- Macros,
- Standards for line types,
- Layers
- Texts
- Dimensions   (No of periods: 18)

Unit IV: Management and basic maintenance of CAD related hardware such as
- Computers and networking hardware
- Printers and Plotters
- Digitizers
- Back up units   (No of periods: 24)

Unit V: Management and maintenance of the entire CAD related

- operating systems,
- Design and Drafting software
- Antivirus software
- Network
- Backing up
- Archiving   (No of periods: 24)

Unit VI: Data exchange and total file management   (No of periods: 18)

SESSIONAL WORK:

A live architectural design project may be taken for individual studies. All the possible aspects to be accommodated and managed by the student. The scope of the project may be relatively small such as a single multistoried building.

RECOMMENDED READINGS:

1. CAD Management: - The Definitive Guide to Systems Set-up, Maintenance and by Katherine Panchyk and Richard Panchyk
2. Smart Manager's Guide to Effective CAD Management by Roy L. Wysack (Paperback - Dec 1985)
3. The Management of CAD for Construction by Stanley Port (Hardcover - Mar 15, 1989)
4. New tools for design, maintenance, and production management. (CAD-CAM systems) : An article from: Plastics Technology by Joseph Ogando (May 1, 1995)

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER III

CA317- RESEARCH METHODOLOGY AND PAPER

TEACHING SCHEME
Lectures: 1
Studios : 3

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 100
Sessional External: NIL
Viva-voce: NIL

COURSE OBJECTIVES AND PREREQUISITES:

The primary objective of this course is to improve skills of technical paper writing and conduct a research that will help students explore the various aspects of this field.

COURSE OUTLINE:

Literature review on a specific topic shall be conducted. The student shall select a topic of their interest (to be approved by the faculty member) and do an extensive research on the available literature. Number of smaller papers shall culminate into a large paper in the format of critical analysis. This paper shall contain abstract, elaboration on the issue at hand, discussion on the issue, critical analysis of the data and practical or theoretical use of this project.

Unit I: Introduction of the format of this subject. Guidance by the faculty members for the possible topics   (No. of periods: 06)
Unit II: Research by the students on potential topics through books, magazines, Internet and other possible resources   (No. of periods: 12)
Unit III: Work in class under the guidance of the faculty member (No. of periods: 30)
Unit IV: Work in class   (No. of periods: 30)
Unit V: Presentation in class   (No. of periods: 24)
Unit VI: Conclusion session   (No. of periods: 06)

SESSIONAL WORK / VIVA:

Sessional work would be in the form of a paper of about 5000 words.
Viva shall be conducted on the basis of the methodology as well as content of the written paper.

RECOMMENDED READINGS:

1. How to write assignments, research papers and dissertations: Bedekar V. H.
2. Research Methods: The Concise Knowledge Base, First Edition by William M. K. Trochim
3. Understanding Research Methods: An Overview of the Essentials by Mildred L. Patten

MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER III

CA318- DIGITAL DESIGN STUDIO – LEVEL 3

TEACHING SCHEME
Lectures: 2
Studios : 8

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 100
Sessional External: 100
Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

The objective of this studio is to develop a specific area of interest that a student may have developed during the course of one year. This may lead to their potential thesis topic.

COURSE OUTLINE:

This shall be an individual project, gearing the students towards the thesis project. The project may be a live architectural project or a potential innovative project, which demands computing at its core for further development. Students shall take up a design project with specific focus/objective such as Virtual Reality, Building Automation, and Visualization etc. They shall produce the design drawings, presentation modules, and take it through digital channels of communications.

Unit I: Introduction of the project   (No of periods: 04)

Unit II: Research on the topic to be selected through books, magazines, internet and other possible resources   (No of periods: 16)

Unit III: Suggestions, improvements, and Approval of the selected topic for the project. Elaborating on the design ideas   (No of periods: 12)

Unit IV: Working on the project in studio   (No of periods: 136)

Unit V: Feedback from the faculty members and improvements by the students   (No of periods: 24)

Unit VI: Presentation in class   (No of periods: 24)

SESSIONAL WORK / VIVA:

This being an individual project, each student shall be judged on preset individual performance criteria, such as ingenuity in design and integration of human-computer interface, presentation, level of complexity, etc. Viva shall be conducted on the basis of the methodology and content of the project.

RECOMMENDED READINGS:

1. Vitruvius: Ten Books on Architecture by Vitruvius, et al
2. The Architecture of the Jumping Universe: A Polemic : How Complexity Science Is Changing Architecture and Culture by Charles Jencks
3. The Writing on the Walls (Architectural Press Monographs) by Anthony Vidler
4. Ontology of Construction: On Nihilism of Technology and Theories of Modern Architecture by Kenneth Frampton (Foreword), Gevork Hartoonian (Paperback - March 28, 1997)
5. Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture by Kenneth Frampton

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER IV

CA419- PROFESSIONAL TRAINING

TEACHING SCHEME

EXAMINATION SCHEME
Paper: NIL
Sessional Internal: 50
Sessional External: NIL
Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

Students should work in an architectural office. Objective is to understand practical aspects like office management, interaction with clients, project design and site management etc. The emphasis should be on use of computers in dealing with various aspects of the architectural profession.

SESSIONAL WORK / VIVA:

Students should submit a report on practical training. Marking will be based on a report and viva presentation.

NAME OF COURSE :
MASTER OF ARCHITECTURE (COMPUTER APPLICATIONS)

SEMESTER IV

CA420 DISSERTATION

TEACHING SCHEME:
Lectures: NIL
Studios : 24

EXAMINATION SCHEME:
Paper: NIL
Sessional Internal: 300
Sessional External: 300
Viva-voce: 50

COURSE OBJECTIVES AND PREREQUISITES:

This shall be in form of a real or virtual project based on a topic of individual preference. This project should be able to demonstrate a reasonable amount of interesting ideas and execution techniques.

COURSE OUTLINE:

The topic for this project shall be pre-approved by the guiding faculty member/members. The scope of this project shall be carefully considered. A student may take one internal and another external guide as subject expert. Dissertation will have a final product in the form of report (of words not less than 10,000 words) on the chosen subject, supported with images, drawings, etc. The students shall work in the studios on self-study guided by the faculty members.

SESSIONAL WORK / VIVA:

The final project shall be assessed based on the predefined criteria, such as ingenuity of ideas, their execution, presentation, level of complexity, etc. Viva may be taken based on the methodology and content of the final project.