PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

I. To prepare students to excel in research or to succeed in Architectural profession through global, rigorous post graduate education.

II. To provide students with a solid foundation in digital, scientific and technological advancement to approach architectural solutions.

III. To train students with good scientific and evaluation tools so as to comprehend, analyze, design, and create architectural solutions for the real life problems.

IV. To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate architectural issues to broader social context.

V. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, and the life-long learning needed for a successful professional career.

PROGRAMME OUTCOMES (POs):

On successful completion of the programme,

1. Graduates will demonstrate knowledge of digital tools and skills and contemporary design process.
2. Graduates will demonstrate an ability to identify, formulate and solve architectural design using contemporary digital techniques.
3. Graduate will demonstrate an ability to design, analyze and interpret data to optimize the final design solutions and optimization techniques.
4. Graduates will demonstrate using the digital tools an ability to design a system, component or process as per needs and specifications – algorithms, scripting.
5. Graduates will demonstrate an ability to visualize and work on laboratory and multidisciplinary tasks.
6. Graduate will demonstrate skills to use modern engineering tools, software and equipment to analyze problems.
7. Graduates will demonstrate knowledge of professional and ethical responsibilities.
8. Graduate will be able to communicate effectively in digital form thru a variety of digital media.
9. Graduate will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.
10. Graduate will develop confidence for self education and ability for life-long learning, learning to work as a team.
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*Signature: Attested*

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Centre For Academic Courses
Anna University, Chennai-600 025.
OBJECTIVES:
- To investigate the contemporary theories of media and their influence on the perception of space and architecture.
- To provide an overview of various contemporary design processes and its relation to computation.

UNIT I  INTRODUCTION  6

UNIT II  ASPECT OF DIGITAL ARCHITECTURE  9

UNIT III  CONTEMPORARY PROCESS  12

UNIT IV  GEOMETRIES AND SURFACES  12
Fractal Geometry and their properties – Architectural applications - Works of Zvi Hecker—Shape Grammar - Shapes, rules and Label - Shape Grammar as analytical and synthetic tools. Combining Shape grammar and Genetic algorithm to optimize architectural solutions - Hyper Surface – Introduction to Hyper surface and concepts of Liquid architecture.

UNIT V  CASE STUDIES  6
Case studies- Study, understanding and analysis of known examples at the national and international levels which demonstrates the contemporary theories of media and their influence on the perception of space and architecture, contemporary design processes and its relation to computation.

TOTAL: 45 PERIODS

OUTCOMES:
- Understanding of the effect of contemporary theories of media on contemporary architectural design.
- Understanding of various contemporary design process and their relation to computation

REFERENCES:
1. Peter Eisenmann, Diagram: An Original Scene of Writing, Diagram Diaries
2. MOVE, UN Studio
DG7101 INTRODUCTION TO ALGORITHMS  L T P/S C  2 0 2 4

OBJECTIVE:

- This course introduces basic methods for the design and analysis of efficient algorithms emphasizing methods useful in practice.

UNIT I THE ‘C’ LANGUAGE AND CONTROL FLOW STRUCTURES  12

UNIT II ARRAYS, STRING FUNCTIONS AND POINTERS  12

UNIT III FUNCTIONS AND STRUCTURES  12
User defined functions – Function categories – Storage classes. Introduction to structures – Arrays of Structures – Structures and functions – Exercises and solutions using the above said utilities.

UNIT IV FILE HANDLING AND FILE I/O  8
Introduction to files – Character I/O from files – Line I/O with Files - Writing records onto files – Reading records from files – Exercises and solutions using the above said utilities.

UNIT V DATA STRUCTURES, STACKS, QUEUES AND BINARY TREES  16
Introduction to Data Structures – Introduction to Linked lists – Manipulation of Singly Linked lists – Doubly linked list – Exercises and solutions using the above said utilities -Introduction of Stacks and Queues – Representing Stacks in C – Queues – Binary trees – Exercises and solutions using the above said utilities.

TOTAL: 60 PERIODS

OUTCOME:

- The student will be proficient in analysis and design of algorithms, recurrences, and techniques to solve them.

REFERENCES:

1. Thinking in C++ second edition Vol. one, Bruce Eckel
2. Thinking in C++ second edition Vol. two, Bruce Eckel & Chunk Allison
3. The C++ programming language (3rd edition) by Bjarne Stronstrup

DG7102 INTRODUCTION TO DESIGN THINKING AND INNOVATION  L T P/S C  3 0 0 3

OBJECTIVE:

Gain an understanding of design and design processes explore interdisciplinary applications of design thinking and gain experience in design thinking.

UNIT I INTRODUCTION TO DESIGN THINKING  6
Description of the design thinking models and stages as well as styles of thinking.

UNIT II DESIGN PROCESSES  10
Design practice from multiple perspectives, addressing how designers, teams, industries and communities create new products and services.
UNIT III DESIGN ECOLOGIES
Aims to understand the contexts and relationships in landscapes of design and innovation - the materials, users, outcomes and organizations at different spatial and temporal scales.

UNIT IV COMPLEXITY AND DESIGN
Applying and developing concepts and methods coming from complexity science in order to understand and support design thinking and practice.

UNIT V COLLABORATIVE DESIGN
Focuses on the social aspects of designing and examines the understanding of diverse modes of engagement in design.

OUTCOMES:
- Understanding of the effect of design thinking on architectural design.
- Learning to understand the context and the social, cultural, material, economic and political situation that usually leads to trying to get clarity from a very complex set of signals and design processes.
- Understanding of various design thinking process and their relation to architectural design.

REFERENCES:

DG7111 ARCHITECTURAL VISUALIZATION STUDIO

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:
Introduction to Virtual environments, Alpha worlds, Digital design studio concept by William Mitchell-Introduction to Hardware components such as data-gloves, Head Mounted Displays, IMAX screens, virtual cave etc-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-Digital tectonics, Morphogenetic design strategies, Reflexive architecture, Hybrid spaces-Other related issues: Contemporary Digital Experimentation and the Radical Avant-garde.

TOTAL: 150 PERIODS
REFERENCES:
1. Hyper Architecture: 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 ZELLLNER
7. Developing Digital Architecture by Yu-Tung Liu (Editor), Yu Tung Liu

DG7251 PERFORMANCE EVALUATION OF BUILDINGS L T P/S C 2 0 2 3

OBJECTIVES
- To investigate the simulation and audit techniques for assessing the energy performance, environmental response and impact of built form.

UNIT I INTRODUCTION TO BUILDING PERFORMANCE EVALUATION 6
Emerging role of performance evaluation in building design and master planning- Performance audit and rating systems- GRIHA, LEED IGBC and BREAM – Architectural Computation and performance audit- Introduction to ECOTECT.

UNIT II PRINCIPLES OF SUSTAINABLE DESIGN 15
E’s of sustainability - Integrated approach to environmental design- Case studies – Comparative analysis of green rating systems, LEED, BREAM and GRIHA – Cognitive , analytical and simulated modeling and design of buildings. Zero Carbon Footprint Building.

UNIT III ENVIRONMENTAL ASSESSMENT METHODS AND MODELING FOR PASSIVE SYSTEMS 15
Modelling and experimental techniques for building assessment/ evaluation and design – Basics of thermal comfort, solar shading/access/ control, day lighting, acoustics air movement etc. – issues and opportunities with current assessment modes/ evaluation tools- Evaluation and assessment based on Building type/ function and program – Building performance with respect to function, program, micro climate, urban planning, envelope design, material – Computer studio and simulation-Mathematical models of heat and mass transfer phenomena through building components: transfer function methods and numerical methods – Models of radiative and convective heat transfer phenomena within buildings

UNIT IV ADVANCE ECOTECT AND ENERGY MODELLING 15
Integration of ECOTECT with BIM, RAPID ENERGY MODELLING - Modelling and performance simulation of existing buildings – residential-institutional- design of a new residential building with ECOTECT

UNIT V SEMINAR AND CASE STUDY PRESENTATION 9
Case study presentation of students on performance evaluation of a building identified by them and approved by the course faculty – Seminar on topics approved by the course faculty.
TOTAL: 60 PERIODS

OUTCOMES
- The students will gain knowledge on environmental assessment methods, audit and simulation techniques.
- Will add value to architectural design processes and equip students with energy modeling skills.
REFERENCES:

AA7251  RESEARCH METHODOLOGIES IN ARCHITECTURE  L T P/S C
3 0 0 3

OBJECTIVES
- To introduce the students to the importance of critical inquiry as a way of gaining knowledge and adding to it through research.
- To expose the students to the various forms of research and research methodologies/processes.
- To engage this understanding in the specific field of architectural research.

UNIT I  INTRODUCTION
9
Basic research issues and concepts- orientation to research process- types of research: historical, qualitative, co-relational, experimental, simulation and modeling, logical argumentation, case study and mixed methods- illustration using research samples

UNIT II  RESEARCH PROCESS
9
Elements of Research process: finding a topic- writing an introduction- stating a purpose of study identifying key research questions and hypotheses- reviewing literature- using theory- defining, delimiting and stating the significance of the study, advanced methods and procedures for data collection and analysis- illustration using research samples

UNIT III  RESEARCHING AND DATA COLLECTION
9
Library and archives- Internet: New information and the role of internet; finding and evaluating sources- misuse- test for reliability- ethics
Methods of data collection- From primary sources: observation and recording, interviews structured and unstructured, questionnaire, open ended and close ended questions and the advantages, sampling- Problems encountered in collecting data from secondary sources.

UNIT IV  REPORT WRITING
6
Research writing in general- Components: referencing- writing the bibliography - developing the outline - presentation; etc.

UNIT V  CASE STUDIES
12
Case studies illustrating how good research can be used from project inception to completion-review of research publications.

TOTAL: 45 PERIODS

OUTCOMES
- The student will develop the skill to identify, decipher and interpret issues relating to architecture based on research enquiry methods.
- The student will gain knowledge of different methods of conducting research and research writing.
REFERENCES
2. Wayne C Booth; Joseph M Williams; Gregory G. Colomb; ‘The Craft of Research’ , 3rd Edition; Chicago guides to writing, editing and publishing;2008
4. Ranjith Kumar; Research Methodology- A step by step guide for beginners-3rd Edition ; Sage Publications;2011
5. John W Creswell; Research design: Qualitative, Quantitative and Mixed Methods Approaches; Sage Publications; 2011.

DG7201 GRAPHICAL ALGORITHMS

OBJECTIVE:
This course will introduce participants to the Fundamental Concepts and Essential Skills necessary for effectively designing with graphical algorithms and aid designers who are exploring new shapes using generative algorithms.

COURSE OUTLINE:
UNIT I
Object Attributes/Parameters, Data Types, Data Structures, and Designing with Algorithm

UNIT II
Parametric Design and its usefulness, its relationship to Design process.

UNIT III
Graphical Algorithms, Use in Exploring Ideas.

UNIT IV
Storage and Access to Data; Manipulating Lists and Data Trees.

UNIT V
Best practices for integrating Graphical Algorithm editor into your Professional Workflow.

OUTCOME:
- The students will develop the aptitude to use advanced 3d modeling, basic data collection and diagramming.
- Understanding of comprehensive use and integrated approach by using multiple platforms, allowing for easy transfer of files between applications.

REFERENCE:

DG7202 THEORY OF DEGITAL ARCHITECTURE

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.

12
UNIT I  INTRODUCTION TO ARCHITECTURAL INTERPRETATIONS  10
Architectural Interpretations in the contexts of culture and socio-economics.

UNIT II  EMERGING COMPUTER TECHNOLOGIES  9
How architecture and all building industry are influenced by emerging computer technologies with the emphasis on digital design processes and digital manufacture possibilities.

UNIT III  CHANGING CULTURES OF THE WORLD DUE TO TECHNOLOGICAL INNOVATIONS  10
Forces which contribute to the cultural change described include: colonization, globalization, and advances in communication, transport and infrastructure improvements.

UNIT IV  ARCHITECTURAL INTERPRETATIONS  10

UNIT V  OTHER THEORETICAL ISSUES  6
Theories of globalization local contexts etc.

TOTAL: 45 PERIODS

OUTCOMES:
- Understanding of the architectural Interpretations in the contexts of culture and socio-economics with a backdrop of emerging Computer Technology.
- Exposing the students to write research paper based on the interpretation, expressing their own opinion.

REFERENCES:
1. Rethinking Architecture: A Reader in Cultural Theory by Neil Leach
3. Architecture Theory since 1968 by K. Michael Hays (Editor)
4. Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965-1995 by Kate Nesbitt
5. The Poetics of Construction in Nineteenth and Twentieth Century Architecture by Kenneth Frampton
6. Complexity and Contradiction in Architecture by Robert Venturi
7. Architecture, Technique and Representation (Critical Voices in Art, Theory, and Culture) by Stan Allen
8. The Paradox of Contemporary Architecture by Peter Cook (Editor), et al
12. Chora Four: Intervals in the Philosophy of Architecture by Alberto Perez-Gomez (Editor), Stephen Parcell (Editor)

DG7211  DIGITAL DESIGN STUDIO I  L T P/S C
0 0 12 6

OBJECTIVES:
- This course focuses in understanding various Contemporary processes and translating them into architecture.
- To compute the methods of quantifying architecture and developing Design from codified data.
The project involves in developing Design prototype to explore various contemporary processes and ideas using shape grammar, fractal, parametric models, and Biometric etc. using major software used in design and video making.

**OUTCOME:**
- The students will develop the aptitude to use Digital Media as a medium to generate complex forms.

**REFERENCES:**

**DG7301 DESIGN OPTIMISATION THROUGH ALGORITHMS**

**OBJECTIVES**
- To introduce students to the concepts and techniques of modern optimization theory and practice.
- To learn and analyze how design optimization enhances the design outcome.

**UNIT I INTRODUCTION**
Optimization and evolutionary design – How can Optimization support the design process - Overview of principles, methods and tools for design optimization

**UNIT II OPTIMIZATION METHOD**
Evolutionary Design Optimization using Genetic Algorithms – Overview of traditional gradient based methods

**UNIT III FUNDAMENTAL CONCEPTS OF OPTIMALITY**
Formulation of the objective function for architectural design – Aggregating multiple objectives and multi-objective optimization – Constraint handling

**UNIT IV DESIGN OPTIMIZATION PRACTICE**
Case Studies by Students on Design Optimization in practice.

**UNIT V MODELING**
Selection of design variables, objectives and constraints - Building optimization models – Post Optimal Analysis

**TOTAL: 45 PERIODS**

**OUTCOME:**
- Students will learn the fundamentals of optimization and its support in the design process.
- Students will learn to create an appropriate simulation model of the design problem to formulate the optimization problem and use algorithmic optimization techniques and computer support tools to solve the problem.

**REFERENCES**
DG7302  DIGITAL PRODUCTION: SOLID MODELING AND RP  L T P/S C  1 0 4 3

OBJECTIVES:
- To outline various Digital Production tool to build artifacts as part of the creative design process.
- To utilize the Prototyping and Modeling as a design medium that supports the full spectrum of digital design as a paperless process.

This course focuses on advanced 3d modeling tools with Computer numerically controlled production processes. It aims to develop prototypes that will enhance design learning. Complex virtual 3d-models would be converted to tactile models through Prototyping. This is to achieve by combining lectures on fabrication technology, exercises on CNC machines and prototyping interfaces.

Working with Stereo Lithography Machines: Introduction to the stereo lithography tools Procedures to transfer solid model into a tessellated surface file. Using Polymer resin to produce prototypes. Practical exercise will be given to model simple objects.

TOTAL: 75 PERIODS

OUTCOME:
- The students will be able to translate the design process through Digital Prototype or Model attribute.

REFERENCES:

DG7311  DESIGN EVALUATION TOOLS  L T P/S C  0 0 6 3

OBJECTIVE:
- To better understand the impact of early design delivery decisions on long-term efficiency and effectiveness of buildings
- To better understand the impact of building delivery processes and decisions on user response both initially and over the life cycle of the building.

Process of systematically evaluating the performance and/or effectiveness of one or more aspects of buildings in relation to issues such as Thermal comfort, visual comfort, aesthetics, cost-effectiveness, functionality, productivity, safety and security, and sustainability.

The course focuses on Pre-Design evaluation of learning environments and Post-occupancy evaluation of learning environments.

This course will train students on various evaluation tools in practice such as VASARI (Green Suite), IES, BIM, IAS etc. and using other convention techniques such as Questionnaire Survey, Physical Measurements of Thermal Environment, Lighting Measurements and other Environmental Measures through case studies for analysis.

TOTAL: 90 PERIODS

OUTCOME:
- Through the evaluations, a range of IEQ problems were diagnosed that would negatively influence the comfort occupants.
- To expose students to various evaluation tools used in various stages of design.
REFERENCES


Web links:
http://autodeskvasari.com/
http://www.iesve.com/

DG7312
DIGITAL DESIGN STUDIO II

OBJECTIVE:
- To train students in using advanced Digital media involving complex situations that require handling of multiple information and algorithmic principles.

This course investigates how digital media can be employed as a generative tool for derivation of form and its transformation. This course takes designers beyond the limits of the commercial digital tools. By applying algorithmic principles, computer programs can be used for form generation. The design projects will focus on parametric modelling and proceed towards complex form generation. Students will develop a brief for a design or a product and through generative process develop complex forms.

TOTAL: 180 PERIODS

OUTCOME:
- The students will develop the aptitude to use Digital Media as a medium to generate complex forms.

REFERENCES:

DG7313
DISSERTATION

OBJECTIVES:
- To promote research in Digital architecture and
- Train the students in collecting, critically analyzing and presenting information in a logical sequence.

Students will identify research topics and in depth explore either the theoretical issue or develop mathematical models/ algorithms. While it is not mandatory, the students subsequently carry both the findings and research into the project work. The topic has to be approved by the supervisor and periodic reviews will be held to assess the progress of the work and also facilitate exchange of ideas. The final oral submission has to be accompanied by a CD and report submission.

TOTAL: 90 PERIODS

OUTCOME:
- Student will be skilled to collect, process and present relevant information in their research topic.
OBJECTIVE:

- To develop a prototype or express theoretical issues using Digital Media in the final design project.

Students will submit a detailed proposal on their topic of interest. The proposal will focus on the development of a product design/building form/developing interfaces between modeling and machining or between two graphic modeling tools/building automation/developing intelligent building controls. The project will be oriented towards developing prototypes and theoretical issues could be exhausted in the dissertation section. The Proposal has to be approved by the committee and the supervisor. There would be periodic reviews of the project. The final presentation will focus at developing and demonstrating a prototype.

TOTAL: 330 PERIODS

OUTCOME:

- The student will be competent to define creative problems within his/her field of design, including research and synthesis of technical, aesthetic, and conceptual knowledge.

DG7001 BUILDING MANAGEMENT AND CONTROL SYSTEMS

OBJECTIVES:

- This course provides a detailed exposure to students regarding the design & application in the field of life safety, electronic security & services automation requirements.
- To expose the students to the mandatory and inevitable integration of building management systems in building construction.

UNIT I SAFETY SYSTEMS – FIRE ALARM & PUBLIC ADDRESS SYSTEM

Objective of a Fire Alarm System, essential components of a Fire Alarm System, Type of detection technology currently in use and Statutory Standards to be followed in design. Explanation of the essential Clauses of the the codes, and various types of Technologies employed in the Fire Alarm System, basic knowledge on how a Fire Alarm system works, designed and installed.

Objective of a Public Address System, essential components of a Public Address System, various types of technologies currently in use and design guidelines to be followed and basic knowledge on how a Public Address System works, is designed and installed.

UNIT II SAFETY SYSTEMS – FIRE SUPPRESSION SYSTEM

Objective of a Fire Suppression System, Explanation on Fire triangle, Essential Components of a Fire Suppression System, different type of Fire Suppression Systems, detailed design criteria for Hand held extinguishers Wet Riser, Sprinkler Systems and various gas Based Fire Suppression System, and Type of Statutory Standards followed in Suppression, Explanation on the essential Clauses and Basic Knowledge on how a Fire Suppression System works, is designed and installed.

UNIT III SECURITY SYSTEMS – ACCESS CONTROL SYSTEM AND INTRUDER ALARM SYSTEM

Introduction to Access Control, Intruder Alarm, Essential Components of each System, and Various types of Technologies employed in the system, Basic knowledge as how they work, are designed and installed.

UNIT IV SECURITY SYSTEMS – CCTV AND PERIMETER PROTECTION

Introduction to CCTV, Perimeter protection system, Essential Components of each System, and Various types of Technologies employed in the system, Basic knowledge as how they work, are designed and installed.
UNIT V INTEGRATED BUILDING MANAGEMENT SYSTEM

The objective of the Integrated Building Management System (IBMS), the list of utility, safety & security systems that are generally monitored & controlled through IBMS, the various components of IBMS, types of integration with the utility, Safety & security systems, explanation in detail on how each utility, safety & security system is integrated to IBMS, details of various parameters that can be monitored & controlled on each utility, safety & security system and the basic knowledge on how they work, are designed and installed.

TOTAL: 45 PERIODS

OUTCOME:
- To ensure that every architect understands & designs the buildings that facilitates safe, code compliant, secure & comfortable buildings for the occupants

REFERENCES:
2. The Principles and Practice of Closed Circuit Television, Mike Constant & Peter Turnbull
4. CCTV Surveillance, Herman Kruegele.

DG7002 DIGITAL COMMUNICATION AND MULTIMEDIA IN DESIGN

OBJECTIVE:
- Objective of this course is to introduce various aspects of multimedia technologies and familiarize them with the practical and theoretical issues.

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 systems.

UNIT II
Audio: Use of audio in computer applications, Video /Image: Analogue and Digital video image basic concepts, capture, digital representation of sound, video and processing.

UNIT III
Using animated textures Real world vs. virtual lighting principles Composing the frame Presentation techniques

UNIT IV
Text and Animation: Text in multimedia, hypertext, hypermedia, Principle of animation, 2D, 3D animation

UNIT V
Animation principles, Post production techniques with adobe Photoshop and Adobe Premiere

TOTAL: 90 PERIODS

OUTCOME:
- Students will learn how smart materials can influence creative ideas, solutions and innovation in design
- Students will learn representational strategies through rendering.
- Students will learn for drawing, editing, and vector manipulation, for post-production.
REFERENCES
5. 3ds Max 2010 Architectural Visualization (advance to expert) - Brian L. Smith
6. 3ds Max 2009 Architectural Visualization (Intermediate to Advanced) - Brian L. Smith
7. The Bare Bones Camera Course for Film and Video – Tom Shroeppe

Useful Websites
http://area.autodesk.com/
http://www.3dcafe.com/
http://www.thegnomonworkshop.com
http://www.3dworldmag.com/

DG7003  HIGH END 3D MODELLING  L T P/S C
OBJECTIVE:
• To allow the students to comprehend and prepare Digital design solution using advance high end modeling and animation.

This course will train students on the high end-3D modeling and animation. This course would Specifically focus on MAYA - The state of art modeling software. The training will look at the following sections Hypergraph Modeling: Nurb Modeling/ Polygon Modeling / Organic Modeling Animation: Working with Key frames and Breakdowns/ Deformers/ Character setup/Rendering: Lighting/ Shading/ Texture Advanced Effects and MEL Scripting Language.

OUTCOME:
• The student will be able to Identify the basic elements in the process of creating a 3D scene and construct 3D models using well proven techniques;

REFERENCES:

DG7004  INTRODUCTION TO SCRIPTING  L T P/S C
OBJECTIVES:
• To deepen the understanding of a range of programming languages and its features.
• To convey the idea of scripting language as a medium between software and create a large systems.

UNIT I  INTRODUCTION TO SCRIPTING  2
Definition and purpose of scripting – Introduction to programming language and software used for scripting.

UNIT II  BASICS OF JAVA  23
UNIT III  JAVA APPLICATIONS AND APPLETS  10
Basic Swing – Advanced Swing and MVC – Multithreaded Programming –
Multithreaded Programming – Network Programming clients/severs.

UNIT IV  DIRECTOR  15
Director Basics – Element of Animation – Time line – Simple presentation using Director

UNIT V  DIRECTOR LINGO  10
Introduction to Interactive Anatomy of Lingo – Element of Scripting - Building Interactive Movie –
Working with Multiple Movie and Casts – MIAW - Scripting with Net savvy Lingo – Lingo and
Lists – Lingo and Audio Video – Xtras

TOTAL: 60 PERIODS

OUTCOME:
• To develop student’s concern of the role of different programming paradigms in
configuring /managing system.

REFERENCES:
1. The Java Class Libraries, Volume 1 & Volume 2 by Patrick Chan, Rosanna Lee, Douglas
Kramer
2. JavaScript: The Definitive Guide by David Flanagan
4. Director 7 and Lingo Bible by Robert Martin, John R. Nyquist, Jonathan P. Bacon

DG7005  SMART MATERIALS  L T P/S C
3 0 0 0 3

OBJECTIVES
• To introduce students to smart materials for use in architectural design – materials and
products that have changeable properties and that are able to reversibly change their shape or
colour in response to physical elements like light, temperature etc
• To examine, in depth, materials and technologies such as LED’s, smart glazing, displays and
interactive surfaces and their contemporary application in architecture.
• To discuss the methods of fabrication, production and construction for innovation in design.

UNIT I  6
Introduction - Innovative Materials – Smart materials in Nature – Current Trends and
Developments

UNIT II  10
Property Changing Smart Materials Photochromics,-Thermochromics- Electrochromics –
Photoadhesives- Electroactive Polymers- Shape Memory Alloys

UNIT III  10
Energy-exchanging smart materials
Phase change Materials (PCM) - Photoluminescents – Photovoltaics, LED’s, Photoelectric-
thermolectric-Piezoelectric

UNIT IV  10
Matter-exchanging smart materials
Gas/Water storing Smart Materials - Absorbent/Super absorbent Polymers- Bioplastics

UNIT V  9
Case Studies by Students on the innovative applications of Smart Materials in Design

TOTAL: 45 PERIODS
OUTCOMES:
- Students will learn the fundamentals of material and comprehensively analyze current applications in architecture.
- Students will learn and explore the potential of smart materials in creative designing.
- Students will focus on the smart material characteristics and explore different methods of material technology transfer to design, thereby inventing innovative approaches to design.

REFERENCES

DG7006 VIRTUAL SOCIETY L T P/S C
3 0 0 3

OBJECTIVE:
- To sensitize the student on the evolution, aspects and characteristics of Virtually Society and its role in Digital architecture in graphic representation and visualizing social structures etc.

UNIT I CULTURAL BASIS 6
Social visualisation through readings, drawn from sociology / Psychology and interface design.

UNIT II ISSUES OF REPRESENTATIONS IDENTITY AND EXPRESSION 12
Meaning through association - subjective - transitory - cross cultural meanings ascribed to an object / Cultural phenomena in virtual objects: nature of identity in an immaterial and intangible environment / Issues of identity deception

UNIT III COMMODIFICATION, COMMERCE AND FASHION 6
Globalization, e-com and marketing- Fashion, identity and marketing- Machines as part of fashion - Role of Fashion and status in the virtual world.

UNIT IV COMMUNICATION AND PEDAGOGY 12
Virtual education and issues of Commodification/ virtual classrooms/ universities Virtual organisational existence / Society of Audience / online social world / Chat rooms / news groups and mailing lists

UNIT V CITY AND ONLINE WORLD 9
City as a metaphor for online world/ city as a hub of information/ place of strange fears/crime and doubtful morality/surveillance and security

TOTAL: 45 PERIODS

OUTCOME:
- The students develop an insight into virtual society for students to know, interact and visualize through specific social media in order to pursue mutual interests or goals.

REFERENCES:
1. Nicholas Negroponte, Being Digital. 1995
5. McCracken. Culture and Consumption.
6. Judith Donath. Identity and Deception in the Virtual Community
The main intent for this course is to introduce students to contemporary digital tools in order to further their skills, allowing them to better design and communicate architectural concepts or ideas fluidly and eloquently.

UNIT I  INTRODUCTION TO WEB DESIGN  15
Basics of web design – Introduction to software used for web design – ADOBE IMAGE READY, DREAMWEAVER, FLASH etc.

UNIT II  STATIC PAGES  15
Slice – URL in ADOBE IMAGEREADY. Creation and Editing of site map – layer, tables, frameset, - CSS style – Forms – tools like insert, roll over etc., in DREAMWEAVER

UNIT III  ANIMATION IN FLASH  15
Introduction to MACROMEDIA FLASH, importing other file formats to Flash- saving and exporting Flash files, Frame by frame animation – Motion Tweening – Shape Tweening

UNIT IV  INTRODUCTION TO SCRIPTING  15
Using Timeline – Frames –Key frames- Creating and using Symbols- Simple scripting in flash – Publishing SWF files

UNIT V  DEVELOPING A WEB SITE  15
Using the skills and concepts learnt with the ADOBE IMAGEREADY, DREAMWEAVER, and FLASH software. Students will develop their portfolio in the form of web pages. These pages have to be uploaded in free public domains.

TOTAL: 75 PERIODS

OUTCOMES:
- To ensure that every architect understands & designs the buildings that facilitates safe, code compliant, secure & comfortable buildings for the occupants
- To ensure that every architect understands and develop a web site using the multiple platforms.

REFERENCES: