B.Arch. Scheduling courses for 10 semesters for those who joined in 2010

SCHEDULING OF COURSES

Sub	1	2	3	4	5	6	7	8
Sem [211+3*]		THEORY COURSES			THEORY CUM STUDIO	COURSES	STUDIO	COURSES
1st [25]	ARA11 [3] Theory of Architecture	ARA12 [3] History of World Architecture I	ARA13 [3] Mathematics	ARA14 [3] Mechanics of Structures	ARA15 [3] Building Materials and Technology I	ARA16 [3] Architectural Graphics I	ARA17 [7] Basic Design and Visual Arts	-
2nd [24]	ARA21 [3] Theory of Design	ARA22 [3] History of World Architecture II	ARA23 [3] Environmental Science	ARA24 [3]Structures and Construction I	ARA25 [3] Building Materials and Technology II	ARA26 [3] Architectural Graphics II	ARA27 [6] Architectural Design 1	-
3rd [25]	ARA31 [2] Art appreciation	ARA32 [3] History of Indian Architecture	ARA33 [2] Building Materials	ARA34 [3] Structures and Construction II	ARA35 [4] Climate Responsive Architecture	ARA36 [4] 3D Visualization and Modeling	ARA37 [7] Architectural Design II	-
4th [25]	ARA41 [2] Site Planning	ARA42 [3] History of Modern Architecture I	ARA43 [2] Building Codes and Practices	ARA44 [3] Structures and Construction III	ARA45 [4] Building Services and Technology I	ARA46 [4] Elective 1 Energy Efficient Architecture / Interior Design	ARA47 [7] Architectural Design III	-
5th [25]	ARA51 [2] Specification and Estimation	ARA52 [3] History of Modern Architecture II	ARA53[2]Elective 2 Traditional Indian Architecture/ Vernacular Architecture	ARA54 [3] Structures and Construction IV	ARA55 [4] Building Services and Technology II	ARA56 [4] Working Drawing for Buildings	ARA57 [7] Architectural Design IV	-
6th [25]	ARA61 [3] Professional Practice	ARA62 [2] Human Settlements and Planning	ARA63 [2] Advance Structures	ARA64 [4] Housing	ARA65 [4] Building Services and Technology III	GEARA66 [3] Elective 3 Landscape Design/Architectural Conservation	ARA67 [7] Architectural Design V	-
7th [22]	ARA71 [3] Building Economics for Architects	ARA72 [3] Elective 4 Facilities Programming & Basic Accounting/ Environmental Behavioral Studies	-	ARA73 [4] Urban Design	-	-	ARA74 [5] Dissertation	ARA75 [7] Architectural Design VI
8th [20]	ARA81 [2] Elective 5 Sustainable Architecture / Project Management /Services in High rise Buildings	ARA82 [2] Elective 6 Computation and Design / Architectural Criticism / Construction Technology	ARA83 [2] Elective 7 Intelligent Buildings / Intellectual Property Rights/ Design Principles for Disaster Management	-	-	-	ARA84 [10] Architectural Thesis	-
9th AND 10th [20]	-	-	-	-	-	-	ARAPT [20] Practical Training	-

* Short Term Courses - 1 credit each

B.Arch. Scheduling courses for 10 semesters for those who joined in 2010

Program Outcome:

- Architectural profession deals directly with man, space, society and thus the future physical world. The B.Arch Program, as a consequence, addresses issues such as relevance to the context, man, society and time, concern to the environment, developments in the building industry, changing trends of a practicing architect etc.
- The B.Arch graduate will have proficiency in **creative**, **logical and lateral thinking processes**, **verbal and visual communication skills**.
- The B.Arch program will give a training specifically catering to the complex array of **multi-faceted technical input and knowledge base** needed for the Architectural Profession.
- **Practical application, hands on training, workshops** are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- The B.Arch graduate acquires knowledge through exposure to the professional fields / industry in the form of a one year practical training with a qualified architect and site/field visits in respective subjects.
- Managerial skills and Professional values are consciously instilled to develop entrepreneur abilities in the student.
- The B.Arch program molds a student in different areas of interests through variety of specializations and ensures continued enhancement of such interests while nurturing other avenues.

Subject Code	Lectures	Tutorials	Practical	Credits
ARA11	3	0	0	3

ARA11 Theory of Architecture

Preamble:

Architecture is a multidimensional, multifaceted profession bridging the gap between the arts and the sciences. The study of architecture involves aesthetics, psychological, perceptional, physical and functional aspects. The Theory of Architecture course provides the theoretical and fundamental inputs to the core subject of Basic and Architectural Design. Therefore the theory of architecture is structured to provide fundamental principles and concepts of architecture and design.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- The principles of architecture to address the context of man, space, society and his physical world.

Competency:

- Understanding of functional and aesthetic aspects of architecture.
- Understanding of the principles of visual and spatial composition.
- Comprehension of the architect's role in a design process.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	20	30
2	Understand	30	30	20
3	Apply	15	20	10
4	Analyse	15	10	20
5	Evaluate	5	10	10
6	Create	5	10	10

Syllabus:

Introduction To Architecture: Functional and Aesthetic Aspects: Definition and description of architecture. Architecture as a profession and the role of architect in brief. The need for appropriate space and environment for performing the activities efficiently. The impact of the built environment on the activity. The two way relationship between activity and environment. The concept of beauty: Philosophical and psychological, subjective and objective perspectives.

Visual Perception and Aesthetic Components of Design : Basic principles of visual perception in architecture: Primary elements form and its visual qualities form and space. Additive forms and subtractive forms. Specific qualities of design to include dominance, dramatic effect, punctuating effect, harmony, unity, climax, accentuation and contrast and colors, color theory, the application of colors. Above aspects to be taught with examples from Architecture.

Principles of Composition: Ordering principles in architecture – axis, symmetry, hierarchy, rhythm, balance. Application of ordering principles in buildings. Proportion – introduction to the concept and various proportioning systems. Theories of proportion, golden section, the order, and anthropometrics proportion. Scale – application of human scale and generic scale in architecture. Above aspects to be taught with examples from Architecture.

Principles of Organisation: Spatial relationship with building examples: Space within space, interlocking spaces, adjacent spaces, spaces linked by a common space. Spatial organization: influencing factors and various types with building examples: centralized, linear, radial, clustered, grid. Function of building circulation, components of building circulation – the building approach, the building entrance, configuration of the path, path space relationship, and form of circulation space with building example. Simple circulation diagrams for buildings. **Architectural Design – Process:** Architectural design: The process and strategies to be considered in evolving design. Understanding the process, methods of case study-Integrating aesthetic and functional aspects in design – relationship between the beliefs, values, aspirations of the user, spatial requirements and the built environment.

References:

- 1. Ernest Burden-Elements of Architectural Design- A visual resource, Van Nostrand Reinhold, 1994.
- 2. Pramar.V.S., 'Design fundamentals in architecture', 1973, Sowmiya publications pvt.Itd, New Delhi.
- 3. Sir Banister Fletcher A History of Architecture, Butterworths,London1987.
- 4. Francis D.K.Ching, Architecture Forms, Space and Order, VanNostrand Publications, Newyork, 1979.
- 5. James C.Snyder, Anthony J.Catarex Introduction to Architecture, McGraw Hill Inc., 1979.
- 6. Simon Unwin, Analysing Architecture, 2003, Routledge,London.

Course content and lecture schedule

No	Торіс	No of lectures
1	Introduction To Architecture: Functional and Aesthe	tic Aspects:
1.1	Definition and description of architecture. Architecture as a profession and the role of architect in brief.	1
1.2	The need for appropriate space and environment for performing the activities efficiently. The impact of the built environment on the activity. The two way relationship between activity and environment.	3
1.3	The concept of beauty: Philosophical and psychological, subjective and objective perspectives.	2
2	Visual Perception and Aesthetic Components of Desi	gn :
2.1	Basic principles of visual perception in architecture: Primary elements form and its visual qualities form and space.	3

2.2	Additive forms and subtractive forms.	2
2.3	Specific qualities of design to include dominance, dramatic effect, punctuating effect, harmony, unity, climax, accentuation and contrast and colors, color theory, the application of colors.	5
	Above aspects to be taught with examples from Architectu	ire.
3	Principles of Composition:	
3.1	Ordering principles in architecture – axis, symmetry, hierarchy, rhythm, balance. Application of ordering principles in buildings.	4
3.2	Proportion – introduction to the concept and various proportioning systems. Theories of proportion, golden section, the order, and anthropometrics proportion.	4
3.3	Scale – application of human scale and generic scale in architecture.	2
	Above aspects to be taught with examples from Architectu	ire.
4	Principles of Organisation:	
4.1	Spatial relationship with building examples: Space within space, interlocking spaces, adjacent spaces, spaces linked by a common space.	2
4.2	Spatial organization: influencing factors and various types with building examples: centralized, linear, radial, clustered, grid.	3
4.3	Function of building circulation, components of building circulation – the building approach, the building entrance, configuration of the path, path space relationship, and form of circulation space with building example.	4
4.4	Simple circulation diagrams for buildings.	1
	Above aspects to be taught with examples from Architectu	ire.
5	Architectural Design – Process:	
5.1	Architectural design: The process and strategies to be considered in evolving design.	2
5.2	Integrating aesthetic and functional aspects in design – relationship between the beliefs, values, and aspirations of the user, spatial requirements and the built environment.	2

1.	N.LakshmiThilagam	nltarch@tce.edu
1.	N.LakshmiThilagam	nltarch@tce.edu

- 2. P.Shabitha
- psarch@tce.edu
- 3. I.Chandramathy
- icarch@tce.edu
- 4. S.RadhaKrishnsn srkarch@tce.edu
- 5. J.Jinu Louishidha Kitchley jinujoshua@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA12	3	0	0	3

ARA12 History of World Architecture I

Preamble:

Study of the evolution of architecture in the ancient world enables a student to understand the various principles and concepts of architecture. It also facilitates the understanding of human response to the regional, cultural, climatic and social factors that influence the architecture. This knowledge enables the student to widen his knowledge base for developing his design skills.

Program Outcome addressed:

This course will address the following aspects

- The principles of architecture to address the context of man, space, society and his physical world.
- Knowledge gain of spatial, typological, constructional and technological evolution of architecture through the study and analysis of case examples.

Competency:

- Understanding the factors influencing architecture.
- Acquisition of Knowledge through the study of architectural characteristics in Prehistoric, Egyptian, Mesopotamian, Greek, Roman and East Asian.
- Analysing case examples.
- A critical aesthetic awareness of the design of buildings and their relationship with their surroundings.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	30	30
2	Understand	40	40	40
3	Apply	10	10	10
4	Analyse	10	10	10
5	Evaluate	10	10	10
6	Create	0	0	0

Syllabus:

Introduction to History of Architecture and prehistoric Age: Importance and chronology of architectural history, Factors influencing Architecture and Factors in Architecture. Development and Classification of Architecture in Prehistoric Age – Evolution of residential and religious architectures from prehistoric age to Iron age.

Egyptian Architecture: Factors influencing Architecture – social, economical, geographical and architectural characteristics – Evolution & Spatial significance of tomb and religious architecture in Egypt. Residential buildings in ancient Egypt.

Mesopotamian Architecture: Factors influencing Architecture – social, economical, geographical and architectural characteristics –Evolution of Sumerian, Babylonian, Assyrian and Persian cultures - Factors influencing architecture – Outline of architectural character – with examples.

European Architecture : Classical Greek period - Evolution of city states – Temples – Culture and built form- Development of art, sculpture, architecture in the archaic and classic periods – Aegean, Hellestic and Hellenistic period Factors influencing architecture – Outline of architectural character – Orders in architecture – optical illusions, urban spaces, Public buildings – examples. Rome: Outline of salient features of Etruscan architecture. Factors influencing Roman architecture, urban spaces, Evolution of Engineering construction techniques of Romans – Public architecture– examples.

East Asian architecture: Ancient China – Factors influencing the Architecture, Architectural features - materials & techniques - Classification – residential, imperial and religious buildings – examples. Ancient Japan –Factors influencing Architecture, Architectural characteristics – Classification- residential, imperial and religious buildings - examples

References:

- 1. Sir Bannister Fletcher, A History Of Architecture, University of London, The Antholone Press, 1986
- 2. Pier Luigi Nervi, General Editor History of World Architecture Series, Harry N. Abrams, Inc. Pub., New York, 1972
- 3. Spiro Kostof A History of Architecture Setting and Rituals, Oxford University Press, London 1985
- 4. S. Lloyd and H. W. Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986.
- 5. Gosta, E. Sandsfrom, Man the Builder, Mc. Graw Hill Book Company, New York 1970
- 6. Xinian Fu, Nancy Shatzman Steinhardt, Chinese Architecture.
- 7. Sir Banister Fletcher, Dan Cruickshank, Sir Banister Fletcher's a History of Architecture, Edition 20.

Course contents and lecture schedule

No.	Торіс	No. of Lectures
1	Introduction to History of Architecture and	
	prehistoric Age	
1.1	Importance and chronology of architectural history	2
1.2	Importance and chronology of architectural history	2
1.3	Development and Classification of Architecture in	4
	Prehistoric Age – Evolution of residential and religious	
	architectures from prehistoric age to Iron age.	
2	Egyptian Architecture:	
2.1	Factors influencing Architecture – social, economical,	2
	geographical and architectural characteristics	
2.2	Evolution & Spatial significance of tomb and religious	2
	architecture in Egypt	
2.3	Residential buildings in ancient Egypt	2
3	Mesopotamian Architecture	
3.1	Factors influencing Architecture – social, economical,	2
	geographical and architectural characteristics	
3.2	Evolution of Sumerian, Babylonian, Assyrian and	2
	Persian cultures - Factors influencing architecture –	

	Outline of architectural character – with examples.	2
4	European Architecture	
4.1	Classical Greek period - Evolution of city states – Development of art, sculpture, architecture in the archaic and classic periods – Aegean, Hellestic and Hellenistic period Factors influencing architecture	3
4.2	Outline of architectural character – Orders in architecture – optical illusions, urban spaces, Public buildings – examples.	3
4.3	Rome: Outline of salient features of Etruscan architecture. Factors influencing Roman architecture, urban spaces.	3
4.4	Evolution of Engineering construction techniques of Romans – Public architecture– examples	3
5	East Asian architecture:	
5.1	Ancient China – Factors influencing the Architecture, Architectural features - materials & techniques - Classification – residential, imperial and religious buildings – examples.	4
5.2	Ancient Japan –Factors influencing Architecture, Architectural characteristics – Classification- residential, imperial and religious buildings - examples	4

- G.Balaji
 S.Subashini
 P.Shabitha gbarch@tce.edu
 - ssarch@tce.edu
- psarch@tce.edu
- 4. J.Jinu Louishidha Kitchley jinujoshua@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA 13	3	0	0	3

ARA13 Mathematics

Preamble:

As architects mathematics is essential for representing a physical situation using formulae (mathematical modeling) for evaluation/manipulation/analysis. This Mathematical Modeling involves understanding of the parameters of the system, the factors uniting them, the conversion of the data into a mathematical form and the process of solving and interpreting the results. This course aims at giving the student the above said knowledge.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in logical and lateral thinking processes.
- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.

Competency:

- Understanding the concepts of Integration and Differentiation to solve complex mathematical relationships.
- Understanding the basics of statistics and probability to enable logical reasoning.
- Understanding the mathematical relationships governing lines and planes
- Comprehension of proportioning systems used in classical architecture.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	10	20	20
2	Understand	30	30	30
3	Apply	60	50	50
4	Analyse			
5	Evaluate			
6	Create			

Syllabus:

Integration & Functions of Two Variables : Integration of rational, trigonometric and irrational functions, properties of definite integrals, Reduction formulae for trigonometric functions. Area bounded by curve – Arc length of curve – volume & surface Area of solids of revolution. Taylor's Theorem with remainder Maxima and Minima (Simple Problems).

Ordinary Differential Equations: Linear, second order and higher order Differential equations with constant coefficients. Differential equations with variable coefficients of Euler type.

Basic Statistics And Probability: The arithmetic mean, median, mode, standard deviation and variance. Regression and correlation, elementary probability theory, conditional probability.

Analytical geometry: Introduction: Direction cosines, Direction rations – Angle between lines Plane: Equations of plane – Angle between planes – Distance between parallel planes. St. Line: Equations of straight line – plane and straight line – coplanar lines - shortest distance between skew lines. (Problem oriented Approach).

Geometry In Architecture: Ratio and systems of proportion – definition and derivation of golden ratio, Fibonacci series.

References:

1. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers, Delhi, 1998 2. P. Kandasamy, K. Thilakavathy and K. Gunavathy, Engineering Mathematics Vol I

and II, S. Chandan Publishers – 1998

3. Kappraff Jay, Connections; The Geometric bridge between art and science, McGraw Hill Inc. Ltd., USA, 1991.

Course contents and lecture schedule

No.	Торіс	No. of
		Lectures
1	Integration & Functions of Two Variables :	
1.1	Integration of rational, trigonometric and irrational functions,	2
	properties of definite integrals	
1.2	Reduction formulae for trigonometric functions.	2
1.3	Area bounded by curve – Arc length of curve – volume & surface	2
	Area of solids of revolution.	
1.4	Taylor's Theorem with remainder Maxima and Minima (Simple	2
	Problems).	
2	Ordinary Differential Equations:	
2.1	Linear, second order and higher order Differential equations with	4
	constant coefficients.	
2.2	Differential equations with variable coefficients of Euler type.	4
3	Basic Statistics And Probability:	
3.1	The arithmetic mean, median, mode, standard deviation and	3
	variance.	
3.2	Regression and correlation, elementary probability theory,	5
	conditional probability.	
4	Analytical geometry:	
4.1	Introduction: Direction cosines, Direction rations – Angle	2
	between lines	
4.2	Plane: Equations of plane – Angle between planes – Distance	4
	between parallel planes.	
4.3	St. Line: Equations of straight line – plane and straight line –	4
	coplanar lines - shortest distance between skew lines.(Problem	
	oriented Approach).	
5	Geometry In Architecture:	
5.1	Ratio and systems of proportion	2
5.2	Definition and derivation of golden ratio, Fibonacci series.	4

Subject Code	Lectures	Tutorials	Practical	Credits
ARA 14	3	0	0	3

ARA14 Mechanics of Structures

Preamble:

Architectural Design becomes a futile exercise if it is not built and lived in. This makes it different from the other art forms. Therefore an architect must have knowledge about the mechanics of built up structures so that he is able to realize his dream designs. This course aims at enabling the student to understand the behaviour of members of a structure subjected to axial force, bending and shear. It introduces various concepts and simple analysis techniques of structural components.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in analytical, logical and rational thinking processes.
- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.

Competency:

- Ability to identify, formulate and solve engineering problems
- Ability to determine the forces in the members of structures
- Ability to determine the internal stresses (compression, tension, shear, bending moment and stress), slope and deflection in two-dimensional determinate structural elements for different end conditions and loads.
- Knowledge acquisition in the fields of mathematics, science and engineering.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	20	30
2	Understand	30	30	20
3	Apply	15	20	10
4	Analyse	15	10	20
5	Evaluate	5	10	10
6	Create	5	10	10

Syllabus:

Forces – definition, type of forces system, composition and resolution of forces, resultant and moment of a force, Varignon's theorem, equilibrium of forces, free body diagram, reaction, analysis of trusses using method of joints.

Centroid – definition, centroid of length, area and volume.

Moment of inertia of plane area, principal moment of inertia, parallel and perpendicular axis theorem, moment of inertia of square, rectangular, circular, triangular, rolled steel sections.

Stress - Tensile, compressive and shear stress, elastic limit, Hooke's law, compound stress.

Beams – cantilever, simply supported, fixed, over hanging, continuous, propped cantilever. **Loads** – concentrated load, uniformly distributed load, uniformly varying load, couples.

Shear force and bending moment - statically determinate beams, relationship between load, shear force and bending moment.

Bending stresses - simply supported, cantilever beams – **Deflection** - cantilever, simply supported, over hanging beams, Double integration method - Macaulay's method.

Statically indeterminate beams - propped cantilever and fixed beams, shear force and bending moment, slope and deflection by Double integration method and Moment area method.

References:

- 1. Bansal R.K., "A Text Book of Strength of Materials", Laxmi Publications, New Delhi, 4th edition, 2007.
- 2. Punmia B.C., and Arunkumar Jain, "Strength of Materials and Theory of Structures", Vol I and Vol II, Laxmi Publications, New Dellhi, 2007.
- *3. Timoshenko S.P., & Young D.H. "Elements of Strength of Materials", East West Press Private Limited, New Delhi , 5th edition.*
- 4. Rajput R.K., "Strength of Materials", Laxmi Publications, New Delhi, 1999.
- 5. Margoulius Ivan, Architects + Engineers = Structures, 2002

Course contents and lecture schedule

No.	Торіс		
1.	Forces		
1.1	Definition, type of forces system, composition – Audiovisual presentations	1	
1.2	Resolution of forces, resultant and moment of a force	1	
1.2	Varignon's theorem, equilibrium of forces, free body diagram, reaction	2	
1.3	Analysis of trusses using method of joints – Audiovisual presentations	4	
2	Centroid, Moment of Force and Stresses		
2.1	Definition- centroid of length, area and volume	1	
2.2	Moment of inertia of plane area – principal moment of inertia – parallel and perpendicular axis theorem	1	
2.3	Moment of inertia of square, rectangular, circular, triangular, rolled steel sections	2	
2.4	Stress - tensile, compressive and shear stress	1	
2.5	Elastic limit, Hooke's law, compound stress	1	
	Physical and digital models to understand the forces and stresses	2	
3	Statically determinate beams		
3.1	Beams - Cantilever, simply supported, fixed, over hanging, continuous, propped cantilever	1	

3.2	Loads – concentrated load, uniformly distributed load, uniformly varying load, couples		
3.3	Shear force and bending moment – cantilever beams	2	
3.4	Shear force and bending moment – simply supported beams	2	
3.5	Shear force and bending moment – overhanging beams	2	
3.6	Relationship between load, shear force and bending moment	1	
	Physical and digital models to understand the shear force	2	
4	Bending stresses		
4.1	Cantilever and simply supported beams	2	
4.2	Deflection of cantilever beams - Double integration method	2	
4.3	Deflection of simply supported beams - Double integration method	2	
4.4	Deflection of simply supported beams – Macaulay's method	2	
	Physical and digital models to understand the behaviour of beams in various support systems	2	
5	Statically indeterminate beams		
5.1	Shear force and bending moment for propped cantilever beams	2	
5.2	Shear force and bending moment for fixed beams	2	
5.3	Deflection by Double integration method.	2	
5.4	Deflection by Moment area method.	2	

- 1. Arunachallam
- 2. M.C.Sundararajan
- J. Jinu Louishidha Kitchley
 KapilaShri

hodcivil@tce.edu mcsciv@tce.edu jinujoshua@tce.edu pksarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA15	2	0	3	3

ARA15 Building Materials and Technology I

Preamble:

The course will concern itself with the understanding of traditional and contemporary building materials and the related construction technology. The student explores the building materials and understands its features and properties. The learning will expose students to scientific principles and hands-on experience through preparation of drawings, model making, and site visits etc.

Program Outcome addressed:

This course will address the following aspects

- The principles of architecture to address the context of man, space, society and his physical world.
- Array of multi-faceted technical input and knowledge base needed for the Architectural profession.
- Practical application, hands on training, workshops on par with the global trends.
- Knowledge acquisition through exposure to the professional fields /site visits/ industry.

Competency:

- Knowledge of the components of buildings, their mechanical assembly, as well as the general environment that buildings occupy.
- Knowledge of appropriate use of available materials as well as how they contribute to the design and technologies of modern buildings.
- Know how the materials and construction technologies of the past like stone and brick masonry, timber construction and its use in contemporary construction technology
- Understanding a variety of building types and systems in the context of design and aesthetics, architectural appropriateness.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	10	10
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	10	20	20
6	Create	10	10	10

Syllabus:

Soil, Lime and Stones: Characteristics of various types of soil and Soil classification system. Types of lime – properties and uses – preparation of lime mortar – mix proportion for various works

Stones: Classification of rocks –various types of stones used for construction – use of stone in building construction – test for stone – deterioration – preservation – various stone finishes like dressing, polishing. Drawings of types of masonry – random rubble and ashlar. Drawings of stone foundation.

Bricks And Clay Products : Properties – uses of brick in building construction types of bricks: traditional and modular – properties of sound bricks – clay products: ceramic, terracotta – types and use in building construction. Drawings of brick bonding - English and Flemish : L- junction, T- junction, intersections. Stretcher and header bond. Rat-trap bond, Creative bonding (including estimation of quantities).Drawings piers and foundation.Drawings of reinforced brick masonry – masonry walls & piers (including estimation of quantities) Drawing of cavity wall(including estimation of quantities)

Building Components: Components and function of foundation, plinth, super structure, openings, lintels, roof, parapet. Building component to be studied through a cross section drawing of a masonry building. Graphical Representation of building materials.

Timber in Building Construction: Softwood and hardwood –varities of timber available - physical properties & uses, seasoning, conversion, defects, decay and preservation of timber, fire retardant treatment, anti-termite treatment, industrial timber – plywood, blockboard, particleboard, fibreboard – timber finishes – veneers, etc. Drawings in : Types of joinery, windows, doors, ventilators, timber partitions, timber built in furniture using plywood.

References:

- 1. Engineering Materials by S.C.Rangwala
- 2. W.B.Mckay, 'Building Conctruction', Vol.1,2,3Longmans,U.K.1981.
- 3. Building Construction by B.C.Punmia, Lakshmi Publications Pvt. Ltd., N.Delhi.
- 1. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 2. Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.
- 3. R.Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
- 4. S.C.Rangawala, Engineering Materials, Charotar Pub. House, Anand, 1997.
- 5. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 6. Allen Edward, Iano Joseph, Fundamentals of Building Construction: Materials and Methods
- 7. Allen Edward, Exercises in Building Construction
- 8. Allen Edward, The Architects Studio Companion: Rules of Thumb for Preliminary Design.
- 9. Deplazes Andrea, Constructing Architecture: Materials, Processes, Structures.
- 10. Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.
- 11. R. Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data London, 1990.

Course contents and lecture schedule

No.	Topics	No. of Lectures
1.	Soil and Lime Stones	
1.1	Characteristics of various types of soil and Soil classification system.	2
1.2	Types of lime – properties and uses	2
1.3	Preparation of lime mortar – mix proportion for various works	1
2.	Stones	
2.1	Classification of rocks –various types of stones used for	1
2.2	Test for stone – Deterioration – Preservation	1
2.2	Various stone finishes like dressing polishing-	1
2.5	Drawings of types of masonry – Random Rubble	3
2.4	Drawings of types of masonry $-$ Ashlar	3
2.5	Drawings of stope foundation	2
2.0	Bricks And Clay Products :	2
3.	Properties – uses of brick in building construction - types of bricks:	2
5.1	traditional and modular – properties of sound bricks	۷
3.2	Clay Products: ceramic, terracotta – types and use in building construction.	2
3.3	Drawings of brick bonding - English: L- junction, T- junction, intersections	2
3.4	Drawings of brick bonding - Flemish : L- junction, T- junction,	2
35	Drawings of brick bonding - Stretcher and header bond	2
3.6	Drawings of brick bonding - Rat-trap bond. Creative bonding	3
0.0	(including estimation of quantities)	U
37	Drawings piers and foundation	3
3.8	Drawings of reinforced brick masonry – masonry walls & piers	3
	(including estimation of quantities)	_
	Drawing of cavity wall(including estimation of quantities)	3
4.	Building Components	
4.1	Graphical Representation of building materials.	2
4.2	Components of Building-Function of Substructure & Superstructure	2
4.3	Building component to be studied through Plan of Small Building or Single Space	2
4.4	Building component to be studied through Cross Section of Small Building or Single Space	2
4.5	Building component to be studied through a elevation drawing of a	2
5	Timber in Building Construction	
51	Softwood and hardwood –varieties of timber available	1
5.2	physical properties & uses	1
5.3	seasoning, conversion.	1
5.4	defects, decay	1
55	preservation of timber	1
5.6	fire retardant treatment	1
57	anti-termite treatment	1
5.8	Industrial timber – plywood, block board, particleboard, and	2
0.0	fiberboard – timber finishes – veneers, etc.	-
5.9	Drawings in : Types of joinery	2
5.1	Drawings in : doors	3

0		
5.1	Drawings in : windows& ventilators	3
1		
5.1	Drawings in : timber partitions	2
2		
5.1	Drawings in : timber built in furniture using plywood.	3
3		

- 1. J.Jinu Loushida Kitchley
- S.Karthikeya Raja
 S.Santhana Iyyappa Sundararaj
- 4. KapilaShri

jinujoshua@tce.edu skrarch@tce.edu ssiarch@tce.edu pksarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA16	2	0	3	3

ARA16 Architectural Graphics I

Preamble:

The communication of Architectural Design ideas to peers, allied professionals and others involves representation of ideas in the form of drawings. An architectural graduate needs to know the conventions and methods of representations used in drawings to convey his/her thoughts effectively. This course introduces the basic conventions of drafting, measured drawings of objects and buildings, straight-line architectural drawing: plan, section, elevation and views.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, and visual communication skills.
- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.
- Practical application, hands on training, workshops on par with the global trends.
- Knowledge acquired through site/field visits.

Competency:

- The students acquire knowledge in basics of line and letter values in construction process.
- Develop drafting and graphic skills using different presentation mediums.
- The subject facilitates the process of analyzing and constructing geometric forms in two and three dimension objects at different sections and planes.

Assessment	t Pattern:

.

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	05	05	05
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	10	10	10
6	Create	05	05	05

Syllabus:

Principles of Graphics: Introduction to Architectural drawing and need for Architectural Drawing. Principles of drafting techniques. Two Dimensional geometrical construction -Construction of polygons, ellipse etc. Introduction to scales, various types of scales, plain scale, Diagonal scale. Introduction to digital media and use of basic software.

Projection of Solids: Principles of Orthographic projections- four projection quadrants. Projection of points, planes and solids. Section of Solids. Model making of solid from simple forms to complex forms. Both manual and computer aided exercises to be given.

Isometric and Axonometric Projection: Introduction to isometric and axonometric projections. Isometric drawings of simple geometric forms and combination of different forms, isometric drawings of real life objects like duster, match box, stool etc. Both manual and computer aided exercises to be given. **Simple Measured Drawings** : Principles of basic architectural drafting-presentation format of measured drawings of simple objects, drawing table, stool etc. Measurement of building elements like columns, door and windows etc. Both manual and computer aided exercises to be given.

References:

- 1. Clande Batley, Indian Architecture, D.B.Taraporevale Sons and Co., Ltd., Bombay
- 2. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
- 3. Robert W.Gill, Basic Perspective, Thames and Hudson, London, 1974.
- 4. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, New York, 1975
- 5. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.
- 6. George A.Dinsmore, Analytical Graphics- D.Van Nostrand, Company inc., Canada.
- 7. John M.Holmes, Applied Perspective, Sir Isaac, Piotman and Sons Lt., London 1954..
- 8. Interiors: Perspective in Architecture Design Graphic-SMA Publishing Co.Ltd.

Japan, 1967.

- 9. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New Yourk, 1964.
- 10. Emest Norling, Perspective drawing, Walter Foster Art Books California, 1986.
- 11. Bernard Alkins-147, Architectural Rendering, Walter Foster Art Books, 1968.

Course contents and lecture schedule

No.	Торіс	No. of
1.	Principles of Graphics	Lectures
1.1	Introduction to Architectural drawing and need for Architectural Drawing. Principles of drafting techniques.	2
1.2	Construction of polygons, ellipse etc	5
1.3	Introduction to scales, various types of scales, plain scale, Diagonal scale.	1
1.4	Drawings in various types of scales- plain and Diagonal.	7
1.5	Introduction to digital technology and use of software	3
2.	Projection of Solids	
2.1	Principles of Orthographic projections- four projection quadrants	3
2.2	Drawings in projection of points, planes	5
2.3	Drawings in projection of solids	7
2.4	Drawings in Section of Solids	7
2.5	Model making of simple and complex forms	3
3	Isometric and Axonometric Projection	
3.1	Introduction to isometric and axonometric projections	1

3.2	Drawings in Isometric and Axonometric projections	7
3.3	Drawings of simple objects in Isometric view	
4.	Simple Measured Drawings	
4.1	measured drawings of simple objects, drawing table, stool	7
4.2	Measurement of building elements like columns, door and	6
	windows etc.	
4.3	Measurement of building elements like columns,	7

- 1. J.Jinu Louishida Kitchley
- 2. G.Balaji
- 3. A.Madhumathi
- 4. S.Subhasini

jinujoshua@tce.edu gbarch@tce.edu madhu@tce.edu ssarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA17	0	0	14	7

ARA17 Basic Design and Visual Arts

Preamble:

The architectural design process involves creative exploration. Creative thinking is enhanced by introduction to aesthetic principles and by developing a vocabulary in visual and basic design. This course enhances a student's visual perception and demonstrative skills through various medium and techniques. It trains the student for the application of visual arts in architectural design development and presentation.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- Principles of visual composition through hands-on experience in designing simple two dimensional and three dimensional compositions.

Competency:

- Initiating the process of design investigation and exploration in both 2D and 3D by introducing exercises on 2D'I and 3D'I compositions and forms.
- Understanding of the principles of visual and spatial composition
- Understanding of basic elements of design such as the point, line, planes, volumes and masses, colour, texture etc
- Proficiency in visual communication skills using various medium in 2 dimensional and 3 dimensional compositions.
- Skills associated with sourcing and using information, decision making, time and task management.

Assessment Pattern:

A minimum of eight evaluations over the span of the semester for a maximum internal assessment mark of 50.

	Blooms Category	CAM (Exercises)
1	Remember	5
2	Understand	10
3	Apply	10
4	Analyse	10
5	Evaluate	10
6	Create	55

Syllabus:

Anthropometrics, aesthetics, 2D composition and representational techniques: Basic Techniques of free hand drawing. Introduction to concepts of colour - Colour application and medium. Understanding of anthropometrics and aesthetic relationships in natural and manmade objects: Exercises involving natural forms and man made objects with respect to their colour, form, texture and structure.

Elements of Design: Exercise to explore the various elements of design- line, shape, form, volume, texture, colour to enhance the student's perception of 2D and 3D composition and organization.

Techniques and principles of 3 dimensional perception and communication: Techniques and principles of model making and sculpturing of basic platonic solids and complex forms for effective 3 dimensional perception and communication, using various materials. *Study models/conceptual models: perception and demonstration of form, depth, texture, and organization using clay, terracotta, thermacol, plaster-of-paris, papers, board, wire.*

Creative and conceptual evolution of design: Exercises aimed at creative and conceptual evolution of design solutions by applying principles such as repetition, rhythm, harmony, proportion systems to train the students in design thinking.

References:

- Maitland Graves, The Art of Colour and Design, McGraw Hill book Company Inc., 1951(2nd Edn.)
- 2. Edward D.Mills-Planning the Architects Hand Book –Bitterworth, London, 1985.
- 3. V.S.Pramar, Design fundamentals in Architecture, Somaiya Publications Pvt.Ltd., New Delhi, 1973.
- 4. Francis D.K.Ching-Architecture- Form Space and order Van Nostrand Reinhold Co., (Canada), 1979.
- 5. John W.Mills- The Technique of sculpture, B.T. Bastsford Limited, New York- Reinhold publishing Corporation, London, 1996
- 6. Elda Fezei, Henry Moore, hamlyn, London, New York, Sydney, Toronto, 1972.
- C. Lawrence Bunchy- Acrylic for Sculpture and Design, 450, West 33rd Street, New York N.Y.10001, 1972.
- 8. Orbid Publishing Ltd., Know how the complete course in Dit and Home Improvements NO.22, Bed Fordbury, London, W.C.2, 1981.
- 9. Charles Wallschlaeger & Synthia Busic Snyder, Basic Visual Concepts & Principles for artists, architects & designers, McGraw hill, USA, 1992.
- 10. Trewin Copplestone, Arts in Society, Prentice Hall Inc, Englewoods Cliffs, N. J. 1983.
- 11. H. Gardner, Art through ages.
- 12. Paul Laseau, Graphic Thinking For Architects and Designers, John Wiley & Sons, New York, 2001.

Course contents and exercises schedule

No.	Торіс	No. of Exercise
		hours
1	Anthropometrics, aesthetics, 2D composition and	
	representational techniques:	
1.1	Basic Techniques of free hand drawing.	6
1.2	Introduction to concepts of colour - Colour application and	6
	medium.	
1.3	Understanding aesthetic relationships in natural and manmade	28
	objects: Exercises involving natural forms and man made objects	
	with respect to their colour, form, texture and structure.	
2	Elements of Design:	
2.1	Exercise to explore the various elements of design- line	6
2.2	Exercise to explore the various elements of design - shape	10
2.3	Exercise to explore the various elements of design - form	10
2.4	Exercise to explore the various elements of design - volume	10
2.5	Exercise to explore the various elements of design- texture	10
2.6	Exercise to explore the various elements of design - colour	6
3	Techniques and principles of 3 dimensional perception and	
	communication:	
3.1	Techniques and principles of model making and sculpturing of	20
	basic platonic solids and complex forms for effective 3 dimensional	
	perception and communication, using various materials.	
3.2	Study models/conceptual models: perception and demonstration of	40
	form, depth, texture, and organization using clay, terracotta,	
	thermacol, plaster-of-paris, papers, board, wire.	
4	Creative and conceptual evolution of design:	
4.1	Exercises aimed at creative and conceptual evolution of design	14
	solutions by applying principles such as repetition to train the	
	students in design thinking.	
4.2	Exercises aimed at creative and conceptual evolution of design	14
	solutions by applying principles such as rhythm to train the	
	students in design thinking.	
4.3	Exercises aimed at creative and conceptual evolution of design	14
	solutions by applying principles such as harmony to train the	
	students in design thinking.	
4.4	Exercises aimed at creative and conceptual evolution of design	14
	solutions by applying principles such as proportion systems to train	
	the students in design thinking.	

Course Designers:

1. J.Jinu Louishidha Kitchley	jinujoshua@tce.edu
-------------------------------	--------------------

2.	KapilaShri
3.	P.Shabitha

pksarch@tce.edu psarch@tce.edu

BOARD OF STUDIES MEETING ON 24.04.2010

Subject Code	Lectures	Tutorials	Practical	Credits
ARA21	3	0	0	3

ARA21 Theory of Design

Preamble:

Design as a profession involves the abilities of creative thinking and execution of ideas. A systematic approach to creative thinking can enhance the perception of a designer to comprehend and network between the multiple aspects of design. Design as an intuitive and systematically evolved process addresses various strategies and concepts for its final realization. The implications/outcome of successful design projects is a trend setter for the various avenues possible in design.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- The complex array of multi-faceted technical input and knowledge base needed to the Architectural Design Profession.

Competency:

- Understanding of creative thinking process and techniques
- Comprehension of design process, concepts and strategies.
- Knowledge acquisition through case examples.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	10	20	20
2	Understand	20	10	20
3	Apply	20	20	10
4	Analyse	10	15	20
5	Evaluate	10	20	15
6	Create	30	15	15

Syllabus:

CREATIVE THINKING: Understanding the term creativity, imagination, theories of thinking, types on thinking - directive thinking, convergent thinking, divergent thinking, visual thinking, vertical and lateral thinking.

TECHIQUES ON CREATIVE THINKING: Creative techniques like checklists, brainstorming, synectics, mind mapping, lateral thinking techniques. Exercises in each of the techniques such as puzzles, traps, maps, problem solving.

DESIGN AND DESIGN PROCESS: Definition of Design. Design process theory, Context for architectural design, stages in design process, stages in the design process such as the five step design process, different considerations, various frame works for the design process. Different approaches to design problem solving. **DESIGN CONCEPTS AND STRATEGIES:** Various approaches to generate ideas for architectural design – types of concepts, personal philosophies and strategies of individual designers, channels to creativity in architecture.

APPLICATIONS OF DESIGN PROCESS IN CASE STUDIES: Understanding approaches to design in Architecture and its allied fields through relevant case examples.

Reference Books

- 1. Morgan, T., & Clifford, "Introduction to Psychology", Tata Mc Graw Hill Publications New York, 1983.
- Keyam, S.M., "Psychology in relation to design" Dowden, Hutchinson an Ross, 1973.
- 3. Hall, E.T., "The Hidden Dimension" New York, Doubleday, 1996.
- 4. Canter, D.V, & Lee, T., "Psychology & The Build Environment", Architectural Press, Londaon, 1974.
- 5. Donna Duerk , "Architectural Programming Information Management for Design", Wiley, John & Sons, Incorporated, 1993

Course content and lecture schedule

S. No	Торіс	No of lectures
1	CREATIVE THINKING:	
1.1	Understanding the term creativity, imagination,	1
1.2	theories of thinking,	1
1.3	Types on thinking - directive thinking, convergent thinking, divergent thinking, visual thinking, vertical and lateral thinking.	4
2	TECHIQUES ON CREATIVE THINKING:	
2.1	Creative techniques like checklists, brainstorming, synectics, mind mapping, lateral thinking techniques.	4
2.2	Exercises in each of the techniques such as puzzles, traps, maps, problem solving.	4
3	DESIGN AND DESIGN PROCESS:	
3.1	Definition of Design. Design process theory, Context for architectural design,	3
3.2	Stages in design process, stages in the design process such as the five step design process, different considerations, various frame works for the design process.	4
3.3	Different approaches to design problem solving.	3
4	DESIGN CONCEPTS AND STRATEGIES:	
4.1	Various approaches to generate ideas for architectural design – types of concepts, personal philosophies and strategies of individual designers,	4
4.2	Channels to creativity in architecture.	2

5	APPLICATIONS OF DESIGN PROCESS IN CASE STUDIES:	
5.1	Understanding approaches to design in Architecture and its allied fields through relevant case examples.	10

1. N.LakshmiThilagam	nltarch@tce.edu
2. P.Shabitha	psarch@tce.edu
3. I.Chandramathy	icarch@tce.edu
4. V. BalaSubramaniam	vbsarch@tce.edu
5. J.Jinu Louishidha Kitchley	y jinujoshua@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA22	3	0	0	3

ARA22 History of World Architecture II

Preamble:

The study of Christian architecture in the European continent enables a student to understand the evolution of architectural styles through ages. This course helps in understanding the link in architectural development in terms of planning principles, material used, techniques involved and effects of socio- cultural, economical, political and climatic conditions. This knowledge enables the student to widen his knowledge base for developing his design skills.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- The principles of architecture to address the context of man, space, society and his physical world.
- Knowledge gain through the study and analysis of case examples.

Competency:

- Understanding the factors influencing Christian architecture.
- Acquisition of Knowledge through the study of architectural characteristics in Early Christian, Byzantine, Romanesque, Gothic, Renaissance
- Analysing case examples.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	30	30
2	Understand	40	40	40
3	Apply	10	10	10
4	Analyse	10	10	10
5	Evaluate	10	10	10
6	Create	0	0	0

Syllabus:

Early Christian and Byzantine: Birth and spread of early Christianity – Evolution of church forms – Factors influencing architecture – Outline of Architectural character – Basilican Churches - Examples

Romanesque : Introduction to origin of Cathedrals and monasteries in Europe. Factors influencing architecture and Outline of Architectural Character in Italy, France and England- examples.

Gothic: Early and late Gothic - Factors influencing architecture and Architectural Character of France, England and Italy-examples.

Renaissance in Italy:Factors influencing Renaissance architecture in Italy and Outline of Architectural Character – Early renaissance, High renaissance and Baroque period. Contributions and philosophies of Michelangelo, Brunelleschi and Andréa Palladio- examples.

Renaissance in England and France: Factors influencing Renaissance architecture in England and France and Outline of Architectural Character - Classical and Rococo period -contributions and philosophies of Inigo Jones, Sir Christopher Wren-examples.

References:

- 1. Sir Bannister Fletcher, A History Of Architecture, University of London, The Antholone Press, 1986
- 2. Pier Luigi Nervi, General Editor History of World Architecture Series, Harry N. Abrams, Inc. Pub., New York, 1972
- 3. Spiro Kostof A History of Architecture Setting and Rituals, Oxford University Press, London 1985
- 4. S. Lloyd and H. W. Muller, History of World Architecture Series, Faber and Faber Ltd., London, 1986.
- 5. Gosta, E. Sandsfrom, Man the Builder, Mc. Graw Hill Book Company, New York 1970

No.	Торіс	No. of Lectures
1	Early Christian and Byzantine	
1.1	Birth and spread of early Christianity – Evolution of	2
	church forms	
1.2	Factors influencing architecture – Outline of	4
	Architectural character – Basilican Churches - Examples	
2	Romanesque	
2.1	Introduction to origin of Cathedrals and monasteries in	2
	Europe	
2.2	Factors influencing architecture and Outline of	2
	Architectural Character in Italy	
2.3	Factors influencing architecture and Outline of	2
	Architectural Character in France	
2.4	Factors influencing architecture and Outline of	2
	Architectural Character in England	
3	Gothic	
3.1	Early and late Gothic	2
3.2	Factors influencing architecture and Architectural	2
	Character of France.	
3.3	Factors influencing architecture and Architectural	3
	Character of England.	
3.4	Factors influencing architecture and Architectural	3
	Character of Italy.	
4	Renaissance in Italy	
4.1	Factors influencing Renaissance architecture in Italy	2
4.2	Outline of Architectural Character – Early renaissance,	2
	High renaissance and Baroque period	
4.3	Contributions and philosophies of Michelangelo,	4
	Brunelleschi and Andréa Palladio- examples.	
5	Renaissance in England and France	
5.1	Factors influencing Renaissance architecture in England	2
	and France	

Course contents and lecture schedule

5.2	Outline of Architectural Character - Classical and	2
	Rococo period	
5.3	Contributions and philosophies of Inigo Jones, Sir	4
	Christopher Wren-examples.	

- 1. G.Balaji gbarch@tce.edu
- 2. S.Subashini ssarch@tce.edu
- 3. P.Shabitha psarch@tce.edu
- 4. J.Jinu Louishidha Kitchley jinujoshua@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA23	3	0	0	3

ARA23 Environmental Science

Preamble:

The alarming rate of exploitation of natural resources by mankind results in total environmental mismanagement. Hence the fundamental knowledge on environment and its science becomes utmost important for every citizen of our country. Architects as builders of future physical world have a great influence on global environment and have a great responsibility sustainable environments, need to be sensitive about what keeps the ecosystem sustainable for humans. The aim of the subject is to impart the basic knowledge on Environmental science.

Program Outcome addressed:

This course will address the following aspects

- The principles of architecture to address the context of man, space, society and his physical world.
- Knowledge gain through the study and analysis of case examples.

Competency:

- Understand the various types of resources
- Understand the structure and function of an ecosystem. Interaction between natural and artificial ecosystems.
- Trace the energy flows through an ecosystem.
- Understand the values of Bio-diversity.
- Comprehend the various Environmental Impacts and various Environmental Laws.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	20	10
2	Understand	50	40	40
3	Apply	10	20	20
4	Analyse	10	10	20
5	Evaluate	0	10	10
6	Create	0	0	0

Syllabus:

General: Multidisciplinary nature of environmental studies- definition- scopeimportance-need for public awareness. Natural resources: Forest: Use and over exploitation, deforestation, timber extraction, mining, dam and their effects on forests and tribal people. Water: Use and over utilization of surface and ground water, floods- draughts. Food: Agriculture - over grazing- effects of modern agriculture, fertilizer- pesticide problem- water logging- salinity.

Ecosystems: Concept of an ecosystem- structure and function- componentsenergy flow in the ecosystem- ecological succession- food chains, food webs and ecological pyramids- types of eco systems- forest ecosystem- grass land ecosystem – desert ecosystem- aquatic ecosystem.

Bio Diversity And Its Conservation: Introduction- definition- genetic, species and ecosystem diversity- bio geographical classification of India- value of biodiversity consumptive use, productive use, social, ethical, aesthetic and option values. Hot spots of biodiversity- threats to biodiversity- habitat loss, poaching of wild life, man wildlife conflicts. Endangered and endemic species of India – conservation of biodiversity- in-situ and ex-situ conservation.

Environmental Pollution: Definition- causes, effects and control measures of air pollution- water pollution- soil pollution- noise pollution- solid waste management- causes, effects and control measures of urban and industrial waste. **Social Issues And The Environment:** Water conservation- rain water harvesting- climate change- global warming- acid rain-ozone layer depletion-waste land reclamation-environmental protection act- air act – water act- wild life protection act- forest conservation act- issues in enforcement- public awareness.

References:

- 1. Suresh .K. Dhameja, Environmental Engineering and management, S.K.Khataria & Sons, Delhi, 2000.
- 2. B.K.Sharma & H.Kaur, An Introduction to Environmental pollution, GOEL Publishing House, Meerut First Edition, 1997 (Unit II & IV)
- 3. B.K.Sharma & H.Kaur, Environmental Chemistry, GOEL Publishing House, Meerut SecondEdition, 1995 (Unit II & IV)
- 4. Wright & Nebel, Environmental science towards a sustainable future, Prentice Hall of India Ltd, 2000.

Course contents and lecture schedule

No.	Торіс	No. of Lectures
1	General	
1.1	Multidisciplinary nature of environmental studies- definition- scope-importance-need for public awareness.	1
1.2	Natural resources : Forest: Use and over exploitation, deforestation, timber extraction, mining, dam and their effects on forests and tribal people.	2
1.3	Water: Use and over utilization of surface and ground water, floods- draughts	2
1.4	Food : Agriculture : over grazing : effects of modern agriculture, fertilizer- pesticide problem- water logging-salinity	2
2	Ecosystems	
2.1	Concept of an ecosystem- structure and function- components- energy flow in the ecosystem- ecological succession- food chains, food webs and ecological pyramids	2
2.2	Types of eco systems- forest ecosystem- grass land ecosystem – desert ecosystem- aquatic ecosystem	2
3	Bio Diversity And Its Conservation	
3.1	Introduction- definition- genetic, species and ecosystem diversity- bio geographical classification of India	2
3.2	Value of biodiversity consumptive use, productive use, social, ethical, aesthetic and option values	2

3.3	Hot spots of biodiversity- threats to biodiversity :	2
	habitat loss, poaching of wild life, man wildlife conflicts	
3.4	Endangered and endemic species of India –	2
	conservation of biodiversity- in-situ and ex-situ	
	conservation	
4	Environmental Pollution	
4.1	Definition- causes, effects and control measures of air	2
	pollution	
4.2	Definition- causes, effects and control measures water	2
	pollution- soil pollution	
4.3	Definition- causes, effects and control measures noise	1
	pollution	
4.4	Solid waste management	2
4.5	Causes, effects and control measures of urban and	2
	industrial waste.	
5	Social Issues And The Environment	
5.1	Water conservation- rain water harvesting	2
5.2	Climate change- global warming- acid rain-ozone layer	2
	depletion	
5.3	Waste land reclamation	2
5.4	Environmental protection act- air act – water act- wild	3
	life protection act- forest conservation act- issues in	
	enforcement- public awareness	

- 1.S.Karthikeyarajaskrarch@tce.edu2.A.Madhumathimadhu@tce.edu3.I.Chandramathyicarch@tce.edu

- 4. S. Santhana Iyyappa Sundararaj ssiarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA24	3	0	2	3

ARA24 Structures and Construction I

Preamble:

The widespread use of reinforced concrete in a variety of structural members in the construction industry has necessitated a proper understanding of the design and detailing procedures adopted by design engineers. This subject presents the whole gamut of design and reinforcement detailing of reinforced concrete structural elements such as beams and slabs under flexure, shear and torsion and columns under compression using Limit State Method of design. This course also contributes primarily to the students' knowledge of engineering topics, and does provide design experience.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes.
- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.

Competency:

- Ability to identify, formulate and solve engineering problems
- State the basis of the analysis of the structure
- Express the design loads in terms of characteristic loads in limit state methods
- Name the different loads, forces and effects to be considered in the design
- Understand the interaction between structural analysis and design
- Understand basic structural behavior and load transfer mechanisms
- Design reinforced concrete members for a variety of typical building applications and to become familiar with design by the Indian Standard Code
- Understand the basic design principles for building applications learned in class apply to buildings.
- Work effectively in small groups to design a reinforced concrete structure considering different loading actions, serviceability and ultimate limit states.

	Blooms Category	Test 1	Test 2	Test 3 / End
1	Remember	30	20	30
2	Understand	30	30	20
3	Apply	15	20	10
4	Analyse	15	10	20
5	Evaluate	5	10	10
6	Create	5	10	10

Assessment Pattern:

Syllabus:

Limit State method of design – Principles, characteristic load and strength, partial safety factor, stress block parameters.

Limit State of collapse - Flexure – balance and under reinforced sections, analysis and design of singly and doubly reinforced rectangular sections, analysis and design of under-reinforced flanged section, serviceability requirements, I/d ratio with medication factor for deflection calculation, cover for durability and fire resistance, reinforcement details in beam for flexure.

Limit State of collapse – Shear and Torsion - design of rectangular and flanged sections for shear, shear-torsion and bending-torsion, reinforcement details in beam for the combined effect of shear and torsion.

Slabs - one way and two way, simply supported and continuous using coefficients given in IS code, reinforcement details in one way and two way slabs. **Continuous beam** - using coefficients given in IS code, reinforcement details in continuous beam.

Limit State of Collapse – Compression - design of columns for axial load – square and rectangular sections with lateral ties, circular section with lateral and spiral ties, design of columns for uniaxial and biaxial eccentricities using interaction charts, reinforcement details for columns.

References:

- 1. S N Sinha, "Reinforced Concrete Design", Tata McGraw-Hill Piblishing Company Limited, New Delhi, 2004
- 2. P.C.Varghese, "Limit State Design of Reinforced Concrete", Prentice Hall of India Private Limited, New Delhi, 2001
- Krishna Raju N. and Pranesh R.N., "Reinforced concerete design IS 456-2000, Principles and practice", New Age International (P) Ltd Publishers, New Delhi, 2003
- 4. Ashok K. Jain, "Reinforced Concrete Limit State Design", 4th Edition Nem Chand & Bros, Roorkee, 1993
- 5. Punmia B.C et al, "Comprehensive RCC Design", Laxmi publications (P) Ltd, New Delhi, 2005
- 6. Gambhir M.I., "Reinforced Concrete Design", Macmilan India Limited, 1993
- 7. Arthur H.Nilson, George Winter, "Design of Concrete Structures", McGraw Hill Book Co., New York, 1972
- 8. Allen Edward, The Architects Studio Companion: Rules of Thumb for Preliminary Design.
- 9. Building Construction by B.C.Punmia, Lakshmi Publications Pvt. Ltd., N.Delhi.
- 10. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.

Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.

- 11. R.Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
- 12. S.C.Rangawala, Engineering Materials, Charotar Pub. House, Anand, 1997.
- 13. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 14. Deplazes Andrea, Constructing Architecture: Materials, Processes, Structures.
- 15. Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.
- 16. R.Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data London, 1990.

IS Codes

- 1. IS 456:2000 Plain and Reinforced Concrete Code of Practice
- 2. IS 875 (1-5):1987 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures
- 3. SP 34:1987 Handbook of concrete reinforcement and detailing
- 4. Handbook for Limit State Design of Reinforced Concrete Structures Roorkee

Course contents and lecture schedule

No.	Торіс	No. of Lectures
1	Limit State method of design	
1.1	Principles, characteristic load and strength, partial safety factor, stress block parameters	1
1.2	Limit State of collapse – Flexure	1
1.3	Balanced and under reinforced sections	1
1.4	Analysis and design of singly reinforced rectangular section	2
1.5	Analysis and design of doubly reinforced rectangular section	2
1.6	Analysis and design of under-reinforced flanged section	2
1.7	Serviceability requirements, I/d ratio with medication factor for deflection calculation, cover for durability and fire resistance	2
1.8	Reinforcement detailing of simply supported rectangular beam	3
1.9	Reinforcement detailing of simply supported flanged beam	3
1.10	Reinforcement detailing of Lintels, sunshades	2
2	Limit State of collapse – Shear and Torsion	
2.1	Design of rectangular and flanged sections for shear	1
2.2	Design of rectangular and flanged sections for shear-torsion	2
2.3	Design of rectangular and flanged sections for bending-torsion	2
2.4	Reinforcement detailing of rectangular and flanged sections under shear	3
2.5	Reinforcement detailing of rectangular and flanged sections under shear-torsion	3

2.6	Reinforcement detailing of rectangular and flanged sections under bending-torsion	3
3	Slabs	
3.1	Design of one way simply supported slab	1
3.2	Design of two way simply supported slab using coefficients given in IS code	2
3.3	Design of continuous slab using coefficients given in IS code	2
3.4	Reinforcement detailing of one way simply supported and continuous slab	3
3.5	Reinforcement detailing of two way simply supported and continuous slab	3
4	Continuous beam	
4.1	Analysis and design of continuous beam using coefficients given in IS code	2
4.0		
4.2	Reinforcement detailing of continuous beam	3
4.2 5	Limit State of Collapse – Compression	3
4.2 5 5.1	Limit State of Collapse – Compression Design of columns for axial load – square and rectangular cross section with lateral ties	3
4.2 5 5.1 5.2	Reinforcement detailing of continuous beam Limit State of Collapse – Compression Design of columns for axial load – square and rectangular cross section with lateral ties Design of columns for axial load –circular cross section with lateral ties Design of columns for axial load –circular cross section with lateral ties	3 2 2
4.2 5 5.1 5.2 5.3	Limit State of Collapse – Compression Design of columns for axial load – square and rectangular cross section with lateral ties Design of columns for axial load –circular cross section with lateral ties Design of columns for axial load –circular cross section with lateral and spiral ties Design of columns with uniaxial eccentricity using interaction charts	3 2 2 2 2
4.2 5 5.1 5.2 5.3 5.4	Reinforcement detailing of continuous beam Limit State of Collapse – Compression Design of columns for axial load – square and rectangular cross section with lateral ties Design of columns for axial load –circular cross section with lateral and spiral ties Design of columns with uniaxial eccentricity using interaction charts Design of columns with biaxial eccentricities using interaction charts	3 2 2 2 2 2 2
4.2 5 5.1 5.2 5.3 5.4 5.5	Reinforcement detailing of continuous beam Limit State of Collapse – Compression Design of columns for axial load – square and rectangular cross section with lateral ties Design of columns for axial load –circular cross section with lateral and spiral ties Design of columns with uniaxial eccentricity using interaction charts Design of columns with biaxial eccentricities using interaction charts Reinforcement detailing of square and rectangular sections with lateral ties	3 2 2 2 2 2 3

- 1. Arunachallam
- 2. M.C.Sundararajan
- 3. J. Jinu Louishidha Kitchley
- 4. KapilaShri

hodcivil@tce.edu mcsciv@tce.edu jinujoshua@tce.edu pksarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA25	2	0	3	3

ARA25 Building Materials and Technology II

Preamble:

The course will concern itself with the understanding of traditional and contemporary building materials and the related construction technology. The student explores the building materials and understands its features and properties. The learning will expose students to scientific principles and hands-on experience through preparation of drawings, model making, and site visits etc.

Program Outcome addressed:

This course will address the following aspects

- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.
- Practical application, hands on training, workshops on par with the global trends.
- Knowledge acquisition through exposure to the professional fields /site visits/ industry.

Competency:

- Understanding of the contributing technologies like Concrete, Ferrous, Non Ferrous Metals & Glass which combine in the design and construction of buildings and which make them safe and comfortable to occupy.
- Knowledge of the components of buildings, their mechanical assembly, as well as the general environment that buildings occupy.
- Knowledge of appropriate use of available materials as well as how they contribute to the design and technologies of modern buildings.
- Know how the materials and construction technologies of the past like stone and brick masonry, timber construction and its use in contemporary construction technology.
- Record and communicate architectural/building detail and design ideas through drawings, models, etc.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	10	10
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	10	20	20
6	Create	10	10	10

Syllabus:

Concrete: Concrete making material- Specification for cement, Fine aggregate, Course aggregate and water- Manufacture of Concrete – Laying of Concrete –

Grading of Concrete - Testing for Concrete-Quality Control for Concrete - Curing of Concrete– Uses of Concrete. Types of concrete - Lightweight, high density, fiber reinforced, polymer concrete - properties and uses of the above-ready mixed concrete - current developments in concrete products and methods of concreting.

Ferrous Metal: Properties and used of cast iron, wrought iron and steelanticorrosive measures for steel-mechanical and heat treatment of steel-market forms of steel-structural steel, stainless steel, steel alloys – properties and uses – Types of steel joints - current developments.Drawings in: Steel doors, and windows – openable and fixed. Design and drawing of grills. Collapsible gates and rolling shutters.

Non Ferrous Metal: Aluminium and Aluminium Alloys - properties and uses-Aluminium products-extrusions, foils, castings, sheets, etc.-tin and lead, properties and uses-current developments. **Aluminium Construction:** Aluminium doors- openable, sliding, pivoted.Aluminium windows-openable, sliding, fixed, pivoted.Aluminum ventilators –top hung, pivoted, louvered .Aluminium partitions, false ceiling.

Glass: Composition of glass, properties and uses, special types of glass – uses, properties and application in the building industry of sheet glass, plate glass, safety glass, tinted- coated glass, glass bricks.

References:

- 1. Engineering Materials by S.C.Rangwala
- 2. W.B.Mckay, 'Building Conctruction', Vol.1,2,3Longmans,U.K.1981.
- 3. Building Construction by B.C.Punmia, Lakshmi Publications Pvt. Ltd., N.Delhi.
- 4. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 5. Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.
- 6. R.Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data, London, 1990.
- 7. S.C.Rangawala, Engineering Materials, Charotar Pub. House, Anand, 1997.
- 8. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 9. Allen Edward, Iano Joseph, Fundamentals of Building Construction: Materials and Methods
- 10. Allen Edward, Exercises in Building Construction
- 11. Allen Edward, The Architects Studio Companion: Rules of Thumb for Preliminary Design.
- 12. Deplazes Andrea, Constructing Architecture: Materials, Processes, Structures.
- 13. Alanwerth, Materials, The Mitchell Pub. Co.Ltd., London, 1986.
- 14. R.Chudleu, Building Construction Handbook', British Library Cataloguing in Publication Data London, 1990.

Course contents and lecture schedule

No.	Topics	No. of Lectures
1.	Concrete	
1.1	Concrete making material- Specification for cement, Fine	2
	aggregate, Course aggregate and water	
1.2	Manufacture of Concrete	2
1.3	Laying of Concrete – Curing of Concrete	2

1.4	Grading of Concrete	1
1.5	Testing for Concrete-Quality Control for Concrete	2
1.6	Uses of Concrete	1
1.7	Types of concrete - Lightweight, high density, fiber reinforced, polymer concrete - properties and uses of the above-ready mixed concrete	3
1.8	Current developments in concrete products and methods of concreting	2
2.	Ferrous Metal	
2.1	Properties and used of cast iron, wrought iron and steel- anticorrosive measures for steel-mechanical and heat treatment of steel	3
2.2	Market forms of steel- structural steel, stainless steel, steel alloys – properties and uses	4
2.3	Types of steel joints - current developments.	3
2.4	Drawings in: Steel doors	3
2.5	Drawings in: Steel windows – Openable and fixed.	3
2.6	Drawings in: Steel Grills and Gates. Design of Steel Grills	3
2.7	Sketches in: Steel Collapsible gates and Steel Rolling Shutters	2
3.	Non Ferrous Metal	
3.1	Aluminium and Aluminium Alloys - properties and uses	1
3.2	Aluminium products-extrusions, foils, castings, sheets, etctin and lead, properties and uses-current developments.	3
3.3	Drawings in: Aluminium Sections in Aluminium Construction	2
3.4	Aluminium Construction: Aluminium doors- openable, sliding, pivoted.	3
3.5	Aluminium Construction: Aluminium windows-openable, sliding, fixed, pivoted.	3
3.6	Aluminium Construction: Aluminum ventilators –top hung, pivoted, louvered.	3
3.7	Aluminium Construction: Aluminium partitions	3
3.8	Aluminium Construction: False ceiling with Aluminium Sections	3
4.	Glass	
4.1	Composition of glass, properties and uses	1
4.2	Special types of glass – Uses, properties and application in the building industry of sheet glass, plate glass, safety glass, tinted-coated glass, glass bricks.	2

- 1. J.Jinu Loushida Kitchley
- 2. S.Karthikeya Raja
- 3. S.Santhana Iyyappa Sundararaj

jinujoshua@tce.edu skrarch@tce.edu ssiarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA26	2	0	3	3

ARA26 Architectural Graphics II

Preamble:

The communication of Architectural Design ideas to peers, allied professionals and others involves representation of ideas in the form of drawings. An architectural graduate needs to know the conventions and methods of representations used in drawings to convey his/her thoughts effectively. This course introduces the basic conventions of drafting, straight-line architectural drawing: plan, section, elevation and views.

Program Outcome addressed:

This course will address the following aspects

- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- The principles of architecture to address the context of man, space, society and his physical world.
- Array of multi-faceted technical input and knowledge base needed for the Architectural Profession.
- Practical application, hands on training, workshops on par with the global trends.
- Knowledge acquired through site/field visits.

Competency:

- The students acquire knowledge perspective drawings
- Develop drafting and graphic skills using different presentation mediums.
- The subject helps the students to understand the sciography concepts in objects and buildings.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	05	05	05
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	10	10	10
6	Create	05	05	05

Syllabus:

Measured Drawing : Detailed measured drawing/documentation of historic and architectural monument or building. Measured drawing of various sites and other landscape elements using hand and computer media.

Perspective : Characteristics of Perspective Drawings, Perspective systems and methods. Two point perspective of simple objects, outdoor and interior view of a

building. One point and three point perspective of interior Perspective theory and practice, commercial method of perspective drawing. Introducing computer 3D drawings.

Sciography : Principles of shades and shadows - Shadows of lines and circles. Shadows of architectural elements. Shadows of circular solids. Shadows on buildings. Sciography using computers.

Architectural Rendering : Rendering techniques for architectural drawings: building perspectives- interiors and exteriors, building plans and site plans, articulating features such as landscape, furniture, human figures etc... Various mediums in: Black and white: pencils, sketch pens, charcoal, pen and ink. Rendering using computers.

References:

- 1. Clande Batley, Indian Architecture, D.B.Taraporevale Sons and Co., Ltd., Bombay
- 2. William Kirby Lockard, Drawing as a Means to Architecture, Van Nostrand, Reinhold Company, New York.
- 3. Robert W.Gill, Basic Perspective, Thames and Hudson, London, 1974.
- 4. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, New York, 1975
- 5. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.
- 6. George A.Dinsmore, Analytical Graphics- D.Van Nostrand, Company inc., Canada.
- 7. John M.Holmes, Applied Perspective, Sir Isaac, Piotman and Sons Lt., London 1954..
- Interiors: Perspective in Architecture Design Graphic-SMA Publishing Co.Ltd. Japan, 1967.
- 9. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New Yourk, 1964.
- 10. Emest Norling, Perspective drawing, Walter Foster Art Books California, 1986.
- 11. Bernard Alkins-147, Architectural Rendering, Walter Foster Art Books, 1968.

Course contents and lecture schedule

No.	Topics	No. of Lectures
1.	Measured Drawing	
1.1	Measured drawings of simple objects, like columns	7
	etc	
1.2	Measured drawings of Historic buildings	13
2.	Perspective	
2.1	Characteristics of Perspective Drawings, Perspective	2
	systems and methods	
2.2	Drawing in two point perspective of simple objects,	7
	outdoor and interior view of a building.	
2.3	Drawing in two point perspective of interior drawings	5
2.5	Commercial methods of perspective methods	4
2.6	Computer aided perspective exercises	7
3	Sciography	
3.1	Principles of shades and shadows	2
3.2	Shadows of lines and circles	3
3.3	Shadows of architectural elements	5

3.4	Computer aided sciography exercises	5
4.	Architectural Rendering	
4.1	Rendering techniques for architectural drawings:	2
4.2	Rendering of building perspectives- interiors and	5
	exteriors	
4.3	Rendering of landscape, furniture, human figures	3
4.4	Computer aided rendering	5

- 1. J.Jinu Louishida Kitchley
- 2. G.Balaji
- 3. A.Madhumathi
- 4. S.Subhasini

jinujoshua@tce.edu gbarch@tce.edu madhu@tce.edu ssarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA27	0	0	12	6

ARA27 Architectural Design I

Preamble:

Architecture is a profession bridging the arts and sciences. The process of architectural design involves the consideration of various factors such as function, activities, spatial requirements, circulation, aesthetic aspects etc. At the introductory level, comprehension of spaces from single activity to multiple activities, single space to multiple spaces, anthropometric space requirements, simple structure, aesthetic considerations etc is significant in the design process. Simultaneously solving and evolving concepts/ ideas of aesthetics and function for these spaces through a systematic design process shall be the focus at the entry level.

Program Outcome:

This course will address the following aspects

- Architectural design to respond to the context, man, society and time, concern to the environment, developments in the building industry, changing trends of a practicing architect etc.
- Proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- Acquisition of knowledge through exposure to the professional fields / site/field visits.
- Understanding of the process of architectural design, various stages and procedures involved in design.

Competency:

- Documentation, analysis and evolving various anthropometric standards for various human activities such as sleeping, working etc
- Understanding, analysis and correlating between various influencing factors of a design such as function, activities, spatial standards, form, volumetric definition, interiors and detailing, colour concepts etc.
- Comprehending the various stages involved in design such as data collection, case study, conceptual and schematic design evolution involving simple structures for single and multiple activity spaces.

	Blooms Category	САМ
1	Remember	05
2	Understand	10
3	Apply	15
4	Analyse	10
5	Evaluate	10
6	Create	50

Assessment Pattern:

Syllabus:

Study and application of space standards and anthropometrics. Including measure drawing and documentation and analysis of an identified space. Exercises involving simple/single space organization – activity analysis, space analysis, anthropometric analysis, circulation pattern, furniture layout etc... Exercises such as bus shelters, kiosks, kitchens, bedroom design etc. Exercises on simple built enclosures, multiple activity space organization such as residence, cottage design etc... Sub module exercises on conceptual/schematic design communication, elementary/study models to enable effective design evolution and design communication to be inbuilt into the main exercise module.

References:

- 1. De Chiara and Callender, Time-Saver Standards for Building Types, Mc Graw Hill Co., New York, 1973
- 2. Nufert Ernst, Architects Data, Blackwell Science Ltd., Britain, 1980
- 3. Julius Panero, Martin Zelick, Human Dimension and Interior Space, Whitney Library of Design, Canada, 1979

Course contents and exercise schedule

No.	Торіс	No. of exercise hours
1	Study and application of space standards and anthropometrics	45
	a) Simple measure drawing exercises	
	b) Documentation and analysis of identified space	
2	Exercises involving simple/ single space organization	30
	 a) Understanding activity analysis, space analysis, anthropometric analysis, circulation pattern, furniture layout 	
	 b) Design exercises simple/ single space organization (Time Project) 	
3	Exercises on simple/ multiple activity space organization	105
	a) Understanding the various parameters of design	
	b) Understanding the process of design	
	c) Design exercises such as residence, cottage	

Course Designers:

1.	N. Lakshmi Thilagam	nltarch@tce.edu
2.	P. Shabitha	psarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA31	2	-	-	2

ARA31 Art appreciation

Preamble:

Art is the source of inspiration for architecture. Identifying the basic elements of arts, principles and techniques is essential for the design process. The analysis of the various expressive forms of art and its interpretation in various culture at different periods of time helps in the understanding of social and political influences on art production and major art movements and /or styles throughout history.

Program Outcome addressed:

- a. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been molded in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

On completion of this course, the students will acquire

- 1. Knowledge about arts and its principles.
- 2. Comprehension about the role of art in architecture.
- 3. Relevance of Art in Architecture.
- 4. Investigate various art movements and its context.
- 5. Evaluate the Art movements.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	30	30	30
5	Evaluate	10	10	10
6	Create	0	0	0



Syllabus:

An introduction to understanding of art - Defining art-its need & meaning. Theories of art, classes & utility of art. Characteristics of art – symbols, skills, values, communicating emotions. Techniques of art - Forms of art like, drawing, painting, sculpturing, photography, print making(block and lithographic prints). Techniques in art forms- abstract, portray, use of mediums such as clay, glass, metal, wood, digital imaging. Styles of art -surrealism, Pointillism. Understanding and appreciation of technical language of art. Art in western world - Art history during classical to renaissance period: Classical Art, Medieval art, Renaissance Art . Artists - Michelangelo, Leonardo Da Vinci Modern Art history - Birth of modern art, cubism, impressionism, expressionism, constructivism. Introduction to futurism – pop art, abstract art, minimalism Modern artists- Picasso, Vincent Art in India - Pre historic India - Cave art, Indus valley civilization, Van Gough Medieval India – Mughals-Islamic art form, south Indian art-Dravidian art and sculptures. Post-independent art -Works of Ravivarma & M.F. Hussain. Recent developments in Indian Art and Architecture.

Text books:

- 1. Ted Drozdowski / Laurie Hoffman, Art and Design, Rockfort publishers.
- 2. Dale G. Cleaver, Art In introduction, 5th edition -Harcourt brace Jovanovich.
- 3. Roy c. Gaven, Indian art, Thames and Hudson.
- 4. Richard Hertz, Theories of Contemporary Art,2nd edition prentice hall 1995
- 5. Gilles Neret, Dali-1904-1989, Taschen.
- 6. Giovanni Lista, Futurism, , Terrail.
- 7. Jue welton, Impressionism, Dorling Kindersley.

Reference Books:

- 1. Opdyke, H.G.-Macmillan, Art and Nature Appreciation, 1993.
- Jean Anne Vincent, College out time series History of Art, Ames & Nobel inc-Newyork.1967.
- 3. Harcourt, Brace&World, Cardver Art though Ages,
- 4. Weilenkampf, How to appreciate prints -, New editon, rev.scribner, 1932.
- 5. Judith Collins, John Welchman, Techniques of Modern Artist, 1987.

- 6. Peter and Linda Murray The Penguin Dictionary of Art and Artists, Penguin books 1989
- 7. Georges & Boudaille, The drawings of Picasso, Hamlyn.

8. Peter and Linda Murray - The Penguin Dictionary of Art and Artists, Penguin books 1989

Co	urse	co	ntent	and	lecture	schedule	

No	Торіс	No of	
		lectures	
1	An introduction to understanding of art		
1.1	Defining art-its need & meaning	1	
1.2	Theories of art, classes & utility of art	2	
1.3	Characteristics of art – symbols, skills, values, communicating emotions	2	
2	Techniques of art		
2.1	Forms of art like, drawing, painting, sculpturing, photography, print making (block and lithographic prints).	2	
2.2	Techniques in art forms- abstract, portray, use of mediums such as clay, glass, metal, wood, digital imaging.	2	
2.3	Styles of art –surrealism, Pointillism. Understanding and appreciation of technical language of art.	2	
3	Art in western world		
3.1	Classical art, Medieval art	1	
3.2	Renaissance art, Artists –Michelangelo, Leonardo Da Vinci	2	
4	Modern Art history		

4.1	Birth of modern art, cubism, impressionism,	
	expressionism, constructivism.	2
4.2	Introduction to futurism pop art abstract art	
4.2	$\begin{bmatrix} m \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	
	minimalism	2
4.3	Modern artists- Picasso, Vincent Van Gough	2
5	Art in India	
5.1	Pre historic India - Cave art, Indus valley	
	civilization	1
5.2	Medieval Indian art - Mughals-Islamic art	
0.2		
	forms.	2
5.3	South Indian art – Dravidian art and sculptures	1
5.4	Post-independent art, Works of Ravivarma & M.F. Hussain. <i>Recent developments in Indian</i>	
	Art and Architecture.	2
	TOTAL NUMBER OF PERIODS	26

- G.Balaji
 Jinu Louishidha Kitchley
- 3. P.Vivek.

gbarch@tce.edu jinujoshua@tce.edu pvkarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA32	3	0	0	3

ARA32 HISTORY OF INDIAN ARCHITECTURE

Preamble:

Study of the evolution of Indian Architecture enables the student to understand the various concepts and principles embedded in Indian Architecture. It also facilitates the human response to contextual factors including culture, climate, geography etc. This knowledge system enables the students to widen his knowledge base in developing design skills.

Program Outcome addressed:

- a. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competencies:

On completion of this course, the students will be able to

- 1. Retain knowledge about the functional and aesthetic aspects of architecture.
- 2. Understand that architecture is a response to culture, technology and social aspects.
- 3. Relate and appreciate the principles of visual and spatial composition.
- 4. Analyse case examples of architecture with a critical aesthetic awareness of the design of buildings and their relationship with their surroundings.
- 5. Assess the architectural characteristics in Early Christian, Byzantine, Romanesque, Gothic, and Renaissance.

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	30	30	30
2	Understand	30	30	30
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	10	10	10
6	Create	0	0	0

Assessment Pattern:

Concept Map:



Syllabus:

Architecture in Ancient India and Early Indian Architecture - Culture and pattern of settlement in Ancient India – Indus Valley Civilization – examples. Impact of Aryan culture – Vedic village - bamboo and wood, wooden constructions in Mauryan rule.

Buddhist Architecture - Architectural Production during Ashoka's rule- Rock cut architecture in the western and Eastern Ghats – examples- Dravidian culture – Rock cut productions under Pallavas, Revival of Hinduism, Evolution of early forms of Hindu temples **Architecture in Medieval India** - Architecture during Chola period – Context - Tanjore, GangaiKonda Cholapuram, Darasuram and Nayak Period Context - Hampi, Madurai, Srirangam. Islamic Architecture in India -Indo Islamic - Introduction and sources of Islamic Architecture in India -Delhi. Provincial style - Introduction and sources of Provincial Architecture in India. Mughal Style: Factors influencing Mughal architecture in India and Outline the Architectural Characters during various period - Delhi, Agra, FathepurSikri. **Architecture in British India** - Colonialism and its impact-Early British Neo classical Architecture-Indo Saracenic Architecture and the works of Chisolm-The institutionalization of Architecture-Building New Delhi.

Text Books:

- 1. Percy Brown, Indian Architecture (Buddhist and Hindu Period), Taraporevala and Sons, Bombay, 1983.
- 2. Percy Brown, Indian Architecture (Islamic Period), Taraporevalla and Sons, Mumbai, 1983
- 3. Satish Grover, The Architecture of India (Buddhist and Hindu Period), Vikas Publishing Housing Pvt.Ltd.,New Delhi, 1981.
- 4. Satish Grover, The Architecture of India (Islamic), Vikash publishing House, Pvt. Ltd., New Delhi, 1981
- 5. Sir Bannister Fletcher, A History of World Architecture, University of London, The Antholone Press, 1986

Reference Books:

- 1. Volwahsen, Living Architecture-India (Buddhist and Hindu), Oxford and IBM,London, 1969.
- 2. Caroline Humphrey Sacred Architecture –Little Brown and Company, 1997.
- 3. Christoper Tadgelli, The History of Architecture in India from the dawn of Civilization to the end of Raj, Longman group, U.K.Ltd., London, 1990.
- 4. Carmen Kagal, Vistara: The Architecture of India, Published By Festival of India, 1986.
- 5. Electa Moniteur, Architecture in India, M/s. Electa France, Milan, 1985.
- 6. George Mitchell, The Hindu Temple, BI Pub., Bombay, 1977.
- 7. Jean Deloche, Chola Group of temples brahadeswara temple, Darasuram, ganagai konda cholapuram, IFP
- 8. Sastri K. A. Nilakanta, R. Champakalakshmi, "History of South India: From Prehistoric Times to the fall of Vijayanagar", Oxford University Press, 2000

Course content and lecture schedule

No	Торіс	No of
		lectures
1	Architecture in Ancient India and Early	
	Indian Architecture	
1.1	Culture and pattern of settlement in Ancient India	1
1.2	Indus Valley Civilization – examples. Impact of	2
	Aryan culture - Vedic village - bamboo and wood,	
	wooden constructions in Mauryan rule.	
1.3	Buddhist Architecture - Architectural Production during Ashoka's rule- Rock cut architecture in the western and Eastern Ghats - examples	3
1.4	Dravidian culture – Rock cut productions under Pallavas	2
1.5	Revival of Hinduism, Evolution of early forms of Hindu temples	2
2	Architecture in Medieval India	
2.1	Architecture during Chola period - Context -	3
	Tanjore, GangaiKonda Cholapuram, Darasuram	
2.2	Nayak Period Context – Hampi, Madurai, Srirangam.	3
2.3	Islamic Architecture in India –Indo Islamic	2

2.4	Introduction and sources of Islamic Architecture in India – Delhi.	3
2.5	Provincial style - Introduction and sources of Provincial Architecture in India.	2
2.6	Mughal Style: Factors influencing Mughal architecture in India	2
2.7	Outline the Architectural Characters during various period - Delhi, Agra, FathepurSikri	5
3	Architecture in British India	
3.1	Colonialism and its impact-Early British Neo classical Architecture	3
3.2	Indo Saracenic Architecture and the works of Chisolm	4
3.3	The institutionalization of Architecture-Building New Delhi.	3
	TOTAL NUMBER OF PERIODS	40

1. G.Balaji

- 2. P.Shabitha
- 3. Jinu Louishidha Kitchley
- 4. S.Subashini

gbarch@tce.edu psarch@tce.edu jinujoshua@tce.edu ssarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA33	2	0	0	2

ARA33 BUILDING MATERIALS

Preamble:

The course will concern itself with the understanding of building material such as Plastics, Adhesives, Sealants, Paints, Varnishes and Distemper and Building Materials for Cost Effective Construction &Innovative Construction. The student explores the building materials and understands its features, properties and their architectural application in the building.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- Understand the properties of the building materials like plastics, adhesives & sealants, protective and decorative materials such as paints, varnishes, distemper
- Retain information about the application of plastics, adhesives & sealant in buildings, application of paints, varnishes & distemper in buildings aesthetics.
- Apply the knowledge about plastics, adhesives & sealant in buildings, application of paints, varnishes & distemper in buildings.
- Evaluate the various techniques developed by organizations such as BMTPC, SERC, CBRI, HUDCO, COSTFORD, and HABITAT.
- Apply the cost effective and innovative construction techniques in specific conditions in building.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	30	30	30
2	Understand	30	30	30
3	Apply	30	30	30
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	0	0	0

Concept Map:



Syllabus:

PLASTICS, ADHESIVES AND SEALANTS-Plastics-Introduction to Plastics-Polymerization-Thermoplastics and Thermosetting Plastics -Properties and Architectural uses of Plastics-Fabrication-PVC Pipes in Buildings-Fibre glass reinforced plastic-Properties and Uses-Application of Plastics in Building-Domes, Door and Window Frames-Internal Partitions and wall paneling-Roof Sheets-Structural Sheets-Temporary Shelter-Water Storage Tanks-Adhesives-Properties of Adhesive-Glues-Types of Glues-Architectural Application of Glues-Sealants-Polysulphide based sealants-Uses-MATERIALS FOR PROTECTIVE AND **DECORATIVE FINISHES-Paints**-Characteristics of Paint-Types of Paint-Aluminium Paints-Anticorrosive Paints-Bituminous Paints- Cellulose Paint-Cement Paint-Colloidal Paint-Emulsion Paint-Enamel Paint-Graphite Paint-Luminous Paint-Oil Paint-Plastic Paint-Painting on different surfaces- New Wood Work- Repainting Old Wood Work- New Iron Work and Steel Work- Repainting Old Ironwork and Steelwork-Galvanized Iron Work-Plastered Surfaces-Concrete Surfaces-Floor Surfaces-Process of Painting-Varnish- Characteristics of Varnish-Types of Varnish-Oil Varnish-Spirit Varnish-Turpentine Varnish-Water Varnish-Process of Varnishing-Distemper-Properties of Distemper-Process of Distemper-White Washing-Colour Washing-Wall Papers-MATERIALS FOR COST EFFECTIVE **CONSTRUCTION-**Introduction to Cost Effective Construction- Building Materials used for Cost Effective Construction-Mud-Properties of Mud-Mud Wall Construction-Mud Flooring-Bamboo- Properties of Bamboo- Construction of Wall, Partitions, Roof etc. using bamboo-Ferro Cement- Properties and Architectural Uses of Ferro cement- Application of Ferro Cement in manufacture of Water Tanks, Doors and Windows-Frame & Shutters-Ferro cement Roofing Systems. Cost Effective and Innovative Construction Techniques developed by Organizations such as BMTPC, SERC, CBRI, HUDCO, COSTFORD, HABITAT etc.

Text Books:

1. S.C.Rangawala, Engineering Materials, Charotar Pub. House, Anand, 1997.

2. W.B.Mckay, 'Building Construction', Vol.1, 2, 3Longmans, U.K.1981.

Reference Books:

- 1. B.C.Punmia, Building Construction, Lakshmi Publications Pvt. Ltd., New Delhi, 1992.
- 2. Don A.Watson, Construction Materials and Processes, McGraw Hill Co., 1972.
- 3. Allen Edward, Iano Joseph, Fundamentals of Building Construction: Materials and Methods, McGraw Hill Co., 1982.

Course content and lecture schedule

No.	Торіс	Periods
1	PLASTICS, ADHESIVES AND SEALANTS	I
1.1	Plastics -Introduction to Plastics-Polymerization-Thermoplastics and Thermosetting Plastics -Properties and Architectural uses of Plastics-Fabrication	3
1.2	PVC Pipes in Buildings-Fibre glass reinforced plastic-Properties and Uses-Application of Plastics in Building-Domes, Door and Window Frames-Internal Partitions and wall paneling-Roof Sheets-Structural Sheets-Temporary Shelter-Water Storage Tanks.	3
1.3	Adhesives-Properties of Adhesive-Glues-Types of Glues- Architectural Application of Glues. Sealants-Polysulphide based sealants-Uses.	2
2	MATERIALS FOR PROTECTIVE AND DECORATIVE FINISHES	
2.1	Paints -Characteristics of Paint-Types of Paint-Aluminium Paints- Anticorrosive Paints-Bituminous Paints- Cellulose Paint-Cement Paint-Colloidal Paint-Emulsion Paint-Enamel Paint-Graphite Paint- Luminous Paint-Oil Paint-Plastic Paint	2
2.2	Painting on different surfaces- New Wood Work- Repainting Old Wood Work- New Iron Work and Steel Work- Repainting Old Ironwork and Steelwork-Galvanized Iron Work-Plastered Surfaces-Concrete Surfaces-Floor Surfaces	2
2.3	Process of Painting	2
2.4	Varnish- Characteristics of Varnish-Types of Varnish-Oil Varnish- Spirit Varnish-Turpentine Varnish-Water Varnish-Process of Varnishing. Distemper-Properties of Distemper-Process of Distemper-White Washing-Colour Washing. Wall Papers	2
3	MATERIALS FOR COST EFFECTIVE CONSTRUCTION	
3.1	Introduction to Cost Effective Construction- Building Materials used for Cost Effective Construction-Mud-Properties of Mud-Mud Wall Construction-Mud Flooring	3
3.2	Bamboo- Properties of Bamboo- Construction of Wall, Partitions, Roof etc. using bamboo	2

3.3	Ferro Cement- Properties and Architectural Uses of Ferro cement- Application of Ferro Cement in manufacture of Water Tanks, Doors and Windows-Frame & Shutters-Ferro cement Roofing Systems.	2
3.4	Cost Effective and Innovative Construction Techniques developed by organization such as BMTPC, SERC, CBRI, HUDCO, COSTFORD, HABITAT etc.	3
	TOTAL NUMBER OF PERIODS	26

- 1. J.Jinu Louishida Kitchley
- 2. S.Santhana Iyyappa Sundararaj

jinujoshua@tce.edu pothi@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA34	2	0	3	3

ARA34 STRUCTURES AND CONSTRUCTION - II

Preamble:

An architectural student needs to understand the structural qualities and constructional detailing of materials. This course aids in the structural understanding of materials such as timber and brick and cost effective construction techniques. This knowledge contributes to the design and detailing skills of the student.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Understand the interaction between structural analysis and design.
- 2. Understand basic structural behavior and load transfer mechanisms of different building elements.
- 3. Apply the basic design principles learned in class to building design.
- 4. Determine and analyse the external and internal forces in the structural members.
- 5. Evaluate the basic analysis and design of the structural elements.
- 6. Create a workable solutions for the structural system in their design process.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	10	10	10

Concept Map:



Syllabus:

STRUCTURAL MATERIALS: BRICK IN MASONRY WALLS AND PIERS: Introduction to Masonry Bearing walls -Solid walls, Cavity walls - Masonry units size, wall thickness, strength of bricks – Allowable stresses – Effective height – slenderness ratio – Net permissible stresses – Analysis and Design of masonry walls – Solid and Cavity – Axial and eccentric loads – Design of Piers – Axial and eccentric loads. TIMBER TRUSS – Introduction to Sloped Roofs – Ridges, Hips, Valleys and Eaves – Slope with respect to Roofing Materials – Wood Rafter Span Ranges – Roof beams parallel to slope and perpendicular to slope – Trusses – Types of trusses, properties and their span ranges – Forces & Stresses in truss, Deflection of Truss – Dummy unit load method - Drawings: Types of Trusses, Joinery details of different members of Timber Truss. STRUCTURAL ELEMENTS: ARCHES: Introduction to Arches, Types of Arches – Theory of Arches - BM Diagram - Design of Masonry arches using empirical equations. Drawings: Types of Arches, Corbelling. FLOORS AND FLOORING – Principles of flooring and terracing – Types of Floors: Brick, Stone, Concrete floors with finishes – Wooden floors – Study of relevant IS codes – Product surveys – Plinth and Steps. Drawings : Types of Floors and Flooring. CONSTRUCTION COST EFFECTIVE CONSTRUCTION - Introduction to Cost TECHNIQUES: Effective Construction Techniques – Need for Cost Effective Construction Techniques – Cost effective foundations, flooring and walling types: Cost-Effective Foundations, Inverted arch foundations, bamboo mat foundations - Cost Effective Roofing Types: Ferro cement roofing system, filler slab roofs, pre cast-roofs ex: funicular shells Brick dome, Brick Vault - Cost-Effective Flooring – Mud, Moorum, Brick flooring, Stone flooring, Cost-Effective Walls - Rat-Trap Bond, Mud wall and other similar walling techniques. Exercises on cost effective construction techniques.

Text Books:

- 1. P.Dayaratnam, "Brick and Reinforced Brick structures", Oxford & IBH publishing, 1987.
- 2. A.S.Arya, "Structural Design in steel, Masonry and Timber", Nemchand & Sons, Roorkee (U.P), 1978.

Reference Books:

- Francis D.K. Ching, Barry S. Onouye, Douglas Zuberbuhler, "Building Structures Illustrated – Patterns, Systems and Design", John Wiley & Sons, Inc., 2009.
- 2. Gautham Bhatia, "Laurie Baker Life works and Writings", HUDCO Publications.
- *3.* "Appropriate Building systems, Instruction manual", Building Materials Technology Promotion Council, New Delhi.

IS Codes:

- 1. IS 883: 1994 Code of Practice for Design of Structural Timber in Building
- 2. IS 1905: 1987 Code of practice for Structural use of Unreinforced Masonry
- 3. IS 2366: 1983 Code of practice for Nail jointed Timber Construction

Course content and lecture schedule:

No	Торіс	lectures
1.0	STRUCTURAL MATERIALS	
1.1	BRICK IN MASONRY WALLS AND PIERS:	
1.1.1	Introduction to Masonry Bearing walls –solid walls, cavity walls.	2
1.1.2	Masonry units - size, wall thickness, strength of bricks.	1
1.1.3	Allowable stresses – Effective height – slenderness ratio – Net permissible stresses.	1
1.1.4	Analysis and design of masonry walls – Solid walls – Axial and eccentric loads.	2
1.1.5	Analysis and design of masonry walls – Cavity walls – Axial and eccentric loads.	2
1.1.6	Design of piers – Axial loads.	2

1.1.7	Design of piers – Eccentric loads.	2
1.2	TIMBER TRUSS	
1.2.1	Introduction to Sloped Roofs – Ridges, Hips, Valleys and	1
	Eaves.	
1.2.2	Slope with respect to Roofing Materials.	2
1.2.3	Wood Rafter Span Ranges – Roof beams parallel to slope	2
	and perpendicular to slope.	
1.2.4	Trusses - Types of trusses, properties and their span	2
	ranges.	
1.2.5	Forces & Stresses in truss, Deflection of Truss.	3
1.2.6	Dummy unit load method.	4
1.2.7	Drawings: Types of Trusses, Joinery details of different	1
	members of Timber Truss.	т
2.0	STRUCTURAL ELEMENTS	
2.1	ARCHES	
2.1.1	Introduction to Arches, Types of Arches.	2
2.1.2	Theory of Arches.	2
2.1.3	BM Diagram for Arches.	2
2.1.4	Design of masonry arches using empirical equations.	3
2.1.5	Drawings: Types of Arches, Corbelling.	3
2.2	FLOORS AND FLOORING	
2.2.1	Principles of flooring and terracing.	1
2.2.2	Types of Floors: Brick, Stone, Concrete floors with finishes.	3

2.2.3	Wooden floors – Study of relevant IS codes – Product surveys.	3
2.2.4	Plinth and Steps.	2
2.2.5	Drawings : Types of Floors and Floorings.	3
3.0	CONSTRUCTION TECHNIQUES	
3.1	COST EFFECTIVE CONSTRUCTION	
3.1.1	Introduction to Cost Effective Construction Techniques, Need for Cost Effective Construction Techniques.	2
3.1.2	Cost-Effective Foundations-Inverted arch foundations, bamboo mat foundations.	2
3.1.3	Cost-Effective Walls – Rat-Trap Bond, Mud wall and other similar walling techniques.	2
3.1.4	Cost Effective Roofing Types – Ferro cement roofing system, filler slab roofs.	2
3.1.5	Pre-cast roofs - ex: Funicular shells, Brick dome, Brick Vault.	2
3.1.6	Cost-Effective flooring – mud, moorum, brick flooring, stone flooring.	2
3.1.7	Exercises on cost effective construction Techniques.	4
	TOTAL NUMBER OF PERIODS	70

- Course Designers: 1. K. Arunachallam
 - 2. K. Sudalaimani
 - 4. J. Jinu Louishidha Kitchley
 - 5. P. Kabila Sri

karcivil@tce.edu ksciv@tce.edu jinujoshua@tce.edu kabilasri@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA35	3	-	2	4

ARA35 CLIMATE RESPONSIVE ARCHITECTURE

Preamble:

To understand the importance of buildings which respond to nature and climate. To equip the students with the knowledge about design strategies for various climatic regions, so that they become sensitive designers

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- e. Graduates will have been molded in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

On completion of this course, the students will be able to

- 1. Discern the various climatic factors and their evaluation
- 2. Understand the effect of day lighting and ventilation in buildings and means to effectively design building interiors for day lighting and ventilation.
- 3. Choose appropriate design elements, strategies, form for comfort.
- 4. Analyse the different design parameters that have to be practiced for different climatic zones.
- 5. Evaluate the thermal properties of materials
- 6. Design building envelopes that are sensitive to the climatic zones and characteristics.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	15	15	15
6	Create	5	5	5





Syllabus:

Climate and Comfort - Definition of the term Climate, Components of climate, Factors that determine climate, Macroclimate and microclimate, study of World climatic zones and Indian climate zone in specific. Thermal comfort factors, body heat exchange, - Effective temperature, Corrected Effective Temperature, calculation of overheated & under heated periods and comfort Zone. Exercises on Effective Temperature nomograph calculations using instruments to calculate outdoor and indoor temperature etc, leading to analysis on thermal comfort. Solar geometry and Sun shading - Solar geometry and movement, sun path diagrams (solar chart), Solar angles, Shadow angles, solar shading masks etc. Method of calculating solar altitude, Azimuth angle and Shadow angle. Isopleth, Solar chart, fitting a shading mask over the overheated period & design of sun shading shadow angle protractors. Exercises on plotting isopleth, exercises on design of sun shading devices for different orientations using shadow angle protractors. Thermal Design Principles in Buildings - Heat exchange process in buildings. Heat flow through materials - Thermal quantities – heat flow rate, conductivity (k-value) & resistivity, conductance through a multi-layered body, surface conductance, transmittance, 'U'value - Time lag and decrement of building elements. Concept of sol-air temperature & solar gain factor exercises in heat loss & heat gain in building assuming steady state assumption (thermal balance equation.) Calculations of conductance, resistance, U value and Time lag of materials - application in selection of building materials. Exercises using thermal balance equations. Natural lighting and ventilation-Day lighting principles, day light factor, Components of daylight factor - the sky component, the internal and external reflected Component, glare, recommended levels of illumination for different types of building interiors. Ventilation and air flow principles, principles of natural ventilation - Stack effect due to the thermal forces, air change, wind flow around buildings and air flow patterns inside buildings., Wind velocity - wind rose diagram , wind pressure. Local factors in wind orientation, Flow pattern inside building using wind tunnels. Exercises on lighting calculations for different work spaces. Building interiors analysis for day lighting and ventilation through software. Using physical models to understand *airflow through buildings.* **Climate responsive design strategies -** Mahoney table - Design parameters(shape, enclosure, size, organization, color, etc) to be considered for Site, Building envelope, streets, open spaces in Hot and Dry, warm and humid, moderate, tropical upland and composite climate – Site visits and case study of climate responsive buildings. *Exercises to device the design strategies using mahoney table.*

Text Books:

- 1. O.H.Koenigsberger and others, Manual of Tropical Housing and Building-Part-I-Climatic Design, Longmans, London, 1980.
- 2. B.Givoni, Man, Climate and Architecture, Applied Science, Banking, Essex, 1982.

Reference Books:

- 1. Donald Watson and Kenneth Labs., climatic Design-McGraw Hill Book Company-New York-1983.
- 2. G.Z.Brown, Sun Wind and light,
- 3. Fuller Moore, Environmental Control System.
- 4. M.Evans-Housing, climate and Comfort-Architectural Press, London, 1980

Course content and lecture schedule

No	Торіс	No of
		lectures
1	Climate and Comfort	
1.1	Definition of the term Climate, Components of climate, Factors that determine climate, Macroclimate and microclimate, study of World climatic zones and Indian climate zone in specific.	2
1.2	Thermal comfort factors, body heat exchange, - Effective temperature, Corrected Effective Temperature, calculation of overheated & under heated periods and comfort Zone.	2
1.3	Exercises on Effective Temperature nomograph calculations using instruments to calculate outdoor	10

	and indoor temperature etc, leading to analysis on	
	thermal comfort.	
2	Solar geometry and Sun shading	
2.1	Solar geometry and movement, sun path diagrams (solar chart), Solar angles, Shadow angles, solar shading masks etc. Method of calculating solar altitude, Azimuth angle and Shadow angle.	2
2.2	Isopleth, Solar chart, fitting a shading mask over	3
	the overheated period & design of sun shading	
	shadow angle protractors.	
2.3	Exercises on plotting isopleth, exercises on design	7
	of sun shading devices for different orientations	
	using shadow angle protractors.	
3	Thermal Design Principles in Buildings	
3.1	Heat exchange process in buildings. Heat flow	3
	through materials - Thermal quantities - heat flow	
	rate, conductivity (k-value) & resistivity,	
	conductance through a multi-layered body, surface	
	conductance, transmittance, 'U'value - Time lag	
	and decrement of building elements.	
3.2	Concept of sol-air temperature & solar gain factor	2
	exercises in heat loss & heat gain in building	
	assuming steady state assumption (thermal	
	balance equation.).	
3.3	Calculations of conductance, resistance, U value	6
	and Time lag of materials - application in selection	
	of building materials. Exercises using thermal	
	balance equations.	
1		

4	Natural lighting and ventilation	
4.1	Day lighting principles, day light factor, Components of daylight factor - the sky component, the internal and external reflected Component, glare, recommended levels of illumination for different types of building interiors.	2
4.2	Stack effect due to the thermal forces, air change, wind flow around buildings and air flow patterns inside buildings-Wind velocity – wind rose diagram, wind pressure. Local factors in wind orientation, Flow pattern inside building using wind tunnels.	2
4.3	Exercises on lighting calculations for different work spaces. Building interiors analysis for day lighting and ventilation through software.	10
4.4	Using physical models to understand airflow through buildings.	6
5	Climate responsive design strategies	
5.1	Mahoney table - Design parameters(shape, enclosure, size, organization, color, etc) to be considered for Site, Building envelope, streets, open spaces in Hot and Dry, warm and humid, moderate, tropical upland and composite climate	3
5.2	Site visits and case study of climate responsive buildings.	4

5.3	Exercises to device the design strategies using	6
	mahoney table	
	70	

- 1. Jinu Louishida Kitchley
- 2. R.ShanthiPriya
- 3. A.Madhumathi
- 4. I.Chandramathy

jinujoshua@tce.edu rsparch@tce.edu madhu@tce.edu icarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA36	1	2	2	4

ARA36 3D VISUALISATION AND MODELING

Preamble:

The course will enable the students to explore various forms using computer media and manual means. The learning will enhance the student's 3Dimensional perception of masses and volumes.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- e. Graduates will have been molded in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

On completion of this course, the students will be able to

- 1. Discern the various methods of form perception and making
- 2. Recognize the spatial values of various simple and complex 3D forms.
- 3. Represent complex forms and spaces in computer and manual means.
- 4. Investigate using manual and computer aided models the possibilities of a form.
- 5. Ability to evaluate the aesthetic expression, functional emphasis of any form.
- 6. Ability to perceive forms and the resultant spaces.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	30	30	30

Concept map:



Syllabus :

Variants in forms: Basic forms, - by position, arrangement and combinations, cross sections, folds rotation, bending twisting etc. **Types of Forms** - Conventional Forms -, Co-ordinate systems – cube, monoclinic, triclinic, rhombic,

hexagonal, rhombohedral, tetragonal system - Unconventional forms - Visual perception of form, visual variables - form, position, relation and dimension, forms – transformation to functional elements, Form Exploration: Bar, Lattice, Surface, Body, Space - Fundamentals & Variants - Arrangements & Combinations - cross section & connections - Intersections – nodal/surface/kinematic connections - Infills - Modified & Curved surfaces - Lattices in space - Bodies & Surfaces in Space – Typologies of Space. 3D modeling techniques: Introduction to 3D modeling techniques - An overview of GUI (Graphical User Interface), types of modeling, transforming objects, Compound objects, modifiers & modifier stack, Lathing, displacement, lofting, Boolean operations using standard and compound primitives, modeling with lofts, low polygon modeling and nurbs modeling. Exercises to explore and experience forms using manual and computer models. Exercises oriented towards the generation of form such as stage design. Expo pavilion design etc. Exploration of Finishes: Building Envelope and its treatment -Textures and Texture Mapping - Using material editor, material browser, mapping textures, lighting, cameras and render effects, environment mapping, fogs and atmospheres. Exercises involving application of texture in the form generated in the previous exercise.

Text Books:

- 1. Rolan Knauer, "Transformation-Basic Principles and Methodology of Design", Birkhauser, 2008.
- 2. 3DS MAX 8 Bible Kelly C.Murdock

Reference Books:

- 1. 3DS MAX- Advanced 3D modeling and animation C & M, CADD Centre
- GoogleSketchup7ReferenceGuide,http://dl.google.com/sketchup/gsu7/ docs/en/SketchUp7 Help.pdf
- 3. Sketch Plan Build : World class architects show how it is done, Harper design, New York, 2005
- 4. MarkMorris, Architectureand the Miniature: Models, John Wiley & sons, USA,2000.
- 5. Data Cad for Architects and Designers, Carol Buehrens., McGraw-Hill Publishing Co.
- 6. AutoCAD reference manual-AutoDesk Inc, 1998.
- 7. Photoshop CS Bible Deke McClelland.
- 8. Adobe Photoshop 7.0 classroom in a book Adobe creative.

Course contents and lecture schedule

No	Торіс	No of lectures
1	Variants in forms:	
1.1	Basic forms, position, arrangement and combinations, cross sections, folds rotation, bending twisting etc.	2
2	Types of Forms	
2.1	Conventional forms - Co-ordinate systems – cube, monoclinic, triclinic, rhombic, hexagonal, rhombohedral, tetragonal system.	1

2.2	Unconventional forms - Visual variables – form,	1
	position, relation and dimension, forms,	
2.3	Transformation to functional elements.	1
3	Form Exploration:	
3.1	Bar, Lattice, Surface, Body, Space	1
3.2	Fundamentals & Variants	1
3.3	Arrangements & Combinations - cross section &	1
	connections	
3.4	Intersections – nodal/surface/kinematic	1
	connections	
3.5	Infills – Modified & Curved surfaces	1
3.6	Lattices in space	1
3.7	Bodies & Surfaces in Space	1
3.8	Typologies of Space.	1
3.9	Exercises to explore and experience forms using	
	manual and computer means – Introduction of a	1
	creative exercise (ex. Nine squares).	
3.10	Exploration of forms and concepts through	10
	sketching and other manual means	
3.11	Explore and experience the created forms using	
	computer models – deriving the basic concept –	3
	exploring further possibilities	
3.12	Explore and experience the created forms using	5
	computer models – finalizing the forms	
4	3D modeling techniques:	
-----	---	----
4.1	Introduction to 3D modeling techniques - An overview of GUI (Graphical User Interface). Types of modeling, transforming objects, Compound objects.	2
4.2	Modifiers & modifier stack, Lathing, displacement	1
4.3	Boolean operations using standard and compound primitives, modeling with lofts	1
4.4	Low polygon modeling and nurbs modeling.	2
4.5	Exercises oriented towards the generation of form such as stage design, Expo pavilion design etc Introduction	1
4.6	Exploration of forms and concepts through sketching and other manual means	10
4.7	Explore and experience the created forms using computer models – deriving the basic concept – exploring further possibilities	5
4.8	Explore and experience the created forms using computer models – finalizing the forms and integrating functions and activities	5
5	Exploration of Finishes:	
5.1	Building Envelope and its treatment	1
5.2	Textures and Texture Mapping - Using material editor, material browser, mapping textures.	1
5.3	Lighting, cameras and render effects, environment mapping, fogs and atmospheres.	1

5.4	Exercises involving application of texture in the form generated in the previous exercise – Conceptual alternatives	5
5.5	Exercises involving application of lighting, cameras and rendering effects for an alternative.	3
	TOTAL NUMBER OF PERIODS	70

- 1. Jinu Louishida Kitchley
- 2. P. Shabitha
- 3. P. Kabila Sri

jinujoshua@tce.edu psarch@tce.edu kabilasri@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA37	-	-	14	7

ARA37 ARCHITECTURAL DESIGN II

Preamble:

The process of architectural design involves the consideration of various factors such as function, activities, spatial requirements, circulation, aesthetic aspects etc. This architectural design studio undertakes comprehension of spaces from multiple user and multiple units in single level planning to multiple level planning, simultaneously gaining exposure in analysis of a design question and the formulation of the problem.

Program Outcome:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competencies:

On completion of this course, the students will be able to

- 1. Recognize the various standards, functional activities and hierarchy of activities in multiple users and multiple units in single and simple multi level building plans.
- 2. Comprehension of the various stages involved in design such as data collection, case study, conceptual and schematic design evolution involving simple structures for single and multiple activity spaces.
- 3. Correlate various influencing factors of a design such as function, activities, spatial standards, form, volumetric definition, etc.
- 4. Analyse a design question and formulate the problem
- 5. Design spaces involving multiple user and multiple units in single level plan.
- 6. Design spaces involving multiple user, multiple units and simple vertical movement.

Syllabus:

Exercises involving multiple user and multiple units in single level plan – activity analysis, space analysis, circulation pattern, furniture layout etc... Exercises such as libraries, banks etc.

Exercises involving multiple user and multiple units with simple vertical movement such as Health centres, nursing homes, primary schools etc...

References:

- 1. De Chiara and Callender, Time-Saver Standards for Building Types, Mc Graw Hill Co., New York, 1973
- 2. Nufert Ernst, Architects Data, Blackwell Science Ltd., Britain, 1980
- 3. Pattern Language
- 4. Sir Christopher Alexander, Timeless way of building
- 5. Julius Panero, Martin Zelick, Human Dimension and Interior Space, Whitney Library of Design, Canada, 1979

Course contents and exercise schedule

No.	Торіс	No. of exercise hours
1.0	Minor project relevant to the design competency aimed at this semester	14
2.0	Exercises involving multiple user and multiple units in single level plan – activity analysis, space analysis, circulation pattern, furniture layout etc Exercises such as libraries, banks etc.	
2.1	Group study, Literature analysis, Standards and Case studies, Presentation of study and group discussion	14
2.2	Concept	14
2.3	Generation of scheme drawings- Circulation pattern, Furniture layout	14
2.4	Presentation	14
3.0	Exercises involving multiple user and multiple units with simple vertical movement such as Health centres, nursing homes, primary schools etc	
3.1	Group study, Literature analysis, Standards and Case studies - Presentation of study and group discussion	35
3.2	Concept	42
3.3	Generation of scheme drawings- Circulation pattern,	28

	Furniture layout	
3.4	Presentation	21
	TOTAL NUMBER OF HOURS	196

- 1. V. BalaSubramaniam
- 2. S. RadhaKrishnan
- 3. G. Balaji
- 4. Jinu Louishidha Kitchley
- 5. P. Shabitha
- 6. G. Asaithambi

vbsarch@tce.edu srkarch@tce.edu gbarch@tce.edu jinujoshua@tce.edu psarch@tce.edu gaarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA41	2	-	-	2

ARA41 SITE PLANNING

Preamble:

To understand the importance and the process of Site planning, systematic approach to site planning with major emphasis on site analysis, circulation and spatial development.

Program Outcome addressed:

- a. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- b. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- c. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Discern the various principles of surveying and leveling.
- 2. Understand the various stages involved in site planning.
- 3. Recognize appropriate issues of site analysis.
- 4. Analyse the site based on the offsite and onsite factors.
- 5. Evaluate the spatial design issues in the site level.
- 6. Design the spatial aspects in a site and to design the site circulation.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	30	30	30
5	Evaluate	10	10	10

6 Create 0 0 0					
	6	Create	0	0	0



Syllabus:

Surveying - Surveying- Object of survey – general principles of surveyingclassification of survey – measurements of horizontal distances – chain surveying principles – compass survey : prismatic compass- designation of bearing - fore and back bearing – local attraction – plane table survey – temporary adjustments – radiation and traverse method. Leveling - Leveling-Terms used in leveling – dumpy level – instruments and adjustments – leveling staves – bench marks leveling methods- Contours- intervals and horizontal characteristics of contoursmethods of locating contours – direct method – indirect method: radial line method, method of squares and cross-section - method of interpolation: arithmetic and graphic method - uses of contours. Site Planning Process - Site Planning Process- Problem solving approach – Programme based to site based design- Site based design- Programme Formulation- Site Selection-Site Inventory & Site Analysis-Symbols and Graphical Representation related to Site. Site Inventory and Site Analysis- Site Inventory-Collection of Onsite & Offsite Factors -Topography-Landform-Soils-Quality & Quantity of Water- Site Drainage-Climate- Vegetation- Visual Aspects-Accessibility-Site Analysis- Process of Site Analysis-Site Synthesis-Site Essence Map. **Spatial Development and Site Circulation -** Spatial perception: relationship of space and mass, enclosure and spatial perception, spatial enclosure. Sense of space: Issues of place ness. Spatial Design: Base and overhead plane. Pedestrian circulation: movement, material, design consideration, linkage and visual system, spatial experience- Vehicular circulation: safety, design consideration and parking.

Text Books:

- 1. John I. Motloch , Introduction to Landscape Design , John Wiley and sons, Inc.,
- 2. John Ormsbee Simonds, Landscape Architecture A manual to Site Planning and design, Mc Graw Hill, 1977.
- 3. G.K.Hiraskar, Basic Civil Engineering, Dhanpat Rai Publications (P) Ltd., New Delhi

Reference Books:

- 1. Kevin Lynch Site Planning MIT Press, Cambridge, MA-1967
- 2. B.C. Punmia, Surveying Vol.1 Standard Book House, New Delhi –1983
- 3. P.B. Shahani Text of Surveying Vol.1. Oxford and IBH Publishing co –1980
- 4. Joseph De.Chiarra and Lee Coppleman Planning Design Criteria Can Nostrand Reinhold Co., New York 1968.

Course content and lecture schedule

No	Торіс	No of
		lectures
1	Surveying	
1.1	Surveying- Object of survey – general principles of surveying- classification of survey – measurements of horizontal distances	2
1.2	Chain surveying principles – compass survey : prismatic compass designation of bearing – fore	3

	and back bearing - local attraction - plane table	
	survey - temporary adjustments - radiation and	
	traverse method	
2	Leveling	
2.1	Leveling-Terms used in leveling – dumpy level –	2
	instruments and adjustments - leveling staves -	
	bench marks – leveling methods	
2.2	Contours- intervals and horizontal characteristics	4
	of contours- methods of locating contours - direct	
	method – indirect method: radial line method,	
	method of squares and cross-section - method of	
	interpolation: arithmetic and graphic method -	
	uses of contours	
3	Site Planning Process	
5		
3.1	Site Planning Process- Problem solving approach	2
3.1	Site Planning Process- Problem solving approach – Programme based to site based design- Site	2
3.1	Site Planning Process- Problem solving approach – Programme based to site based design- Site based design- Programme Formulation	2
3.1	Site Planning Process- Problem solving approach – Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis-	2
3.1	Site Planning Process- Problem solving approach – Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to	2
3.1	Site Planning Process- Problem solving approach – Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site	2 3
3.1 3.2 4	 Site Planning Process- Problem solving approach Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site Site Inventory and Site Analysis 	2 3
3.1 3.2 4.1	Site Planning Process Problem solving approach – Programme based to site based design Site based design Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site Site Inventory and Site Analysis Site Inventory-Collection of Onsite & Offsite	2 3 2
3.1 3.2 4.1	 Site Planning Process- Problem solving approach Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site Site Inventory and Site Analysis Site Inventory-Collection of Onsite & Offsite Factors –Topography-Landform-Soils-Quality & 	2 3 2
3.1 3.2 4.1	 Site Planning Process- Problem solving approach Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site Site Inventory and Site Analysis Site Inventory-Collection of Onsite & Offsite Factors –Topography-Landform-Soils-Quality & Quantity of Water 	2 3 2 2
3.1 3.2 4.1 4.2	 Site Planning Process- Problem solving approach Programme based to site based design- Site based design- Programme Formulation Site Selection-Site Inventory & Site Analysis- Symbols and Graphical Representation related to Site Site Inventory and Site Analysis Site Inventory-Collection of Onsite & Offsite Factors –Topography-Landform-Soils-Quality & Quantity of Water Site Drainage-Climate- Vegetation- Visual 	2 3 2 3 3

	Site Analysis-Site Synthesis-Site Essence Map.	
5	Spatial Development and Site Circulation	
5.1	Spatial perception: relationship of space and mass, enclosure and spatial perception, spatial enclosure. Sense of space: Issues of place ness. Spatial Design: Base and overhead plane.	2
5.2	Pedestrian circulation: movement, material, design consideration, linkage and visual system, spatial experience- Vehicular circulation: safety, design consideration and parking.	3
	TOTAL NUMBER OF PERIODS	26

- 1. S.Karthikeya Raja
- 2. A.Madhumathi
- 3. I.Chandramathy
- 4. S.Santhana Iyyappa Sundararaj

skrarch@tce.edu madhu@tce.edu icarch@tce.edu ssiarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA42	3	-	-	3

ARA42 HISTORY OF MODERN ARCHITECTURE I

Preamble:

Architecture in the 20th century was an exploration in pursuit of a universal style. The study of Modern architecture enables the student to understand the response of architecture to technological advancement and the modernization of society due to industrial revolution, its decline and the emergence of post modernism.

Program Outcome addressed:

- a. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.

d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Retain knowledge about the influence of materials and technology on architecture.
- 2. Understand the interpretations of function and culture in architecture.
- Evaluate the advantages and disadvantages of modern architecture and its effect on architectural style of the world of the 20th Century.
- 4. Comprehend the influence of materials and technology on architecture.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	30	30	30
2	Understand	30	30	30
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	10	10	10
6	Create	0	0	0

Concept Map :



Syllabus:

Formative strands of Modern Architecture - Transformations in Neoclassicism. Industrial Revolution - Introduction of new material and technology –structural innovations and the evolution of large span structures. Introduction of new building types and a search for an appropriate architectural style. Arts and crafts movement, art nouveau- works of architects like Mackintosh, Antonio Gaudi. Influences from - Futurism, Expressionism, Constructivism, Destijl, Cubism, America Avant Garde, Chicago school, early works F.L.Wright. Modern Architecture - Werkbund and Bauhaus, New conception of space –International style, CIAM. Works and ideas of Mies Van De Rohe, Philip Johnson, and Le Corbusier. Works and ideas of later works of F.L.Wright, Louis Khan, Richard Neutra, Eero Saarinen Oscar Neimeyer, B.Fuller, Alvar Aalto. Criticism and challenges towards modern architecture. After Modernism - Post Modernism -Tools of new Architecture, Technological advancements, Metabolism, Archigram, Deconstructivism. High Tech Architecture and Architecture of skyscrapers -High tech architecture – Richard Rogers, Renzo Piano, Normen Foster. Evolution of skyscrapers – concepts of structural design, technological applications, stylistic evolution through contemporary examples.

Text books:

- 1. Kenneth Frampton, Modern Architecture : A Critical History, Thames and Hudson,London,1994
- 2. Curtis, William J. R., Modern Architecture Since 1900, Phaidon Press, Oxford 1982; Prentice-Hall, Englewood NJ 1982

Reference Books:

- 1. Manfredo Taferi/Francesco dal co., Modern Architecture, Faber and Faber/Electa, 1980
- 2. Sigfried Gideon, Space, Time and Architecture : The growth of a new Tradition, Harvard University Press, 1978
- 3. Leonordo Benevolo, History of Modern Architecture, 2 Vols, Routledge & KeganPaul, London, 1971
- 4. Nikolaus Pevsner, Pioneers of Modern Design: From William Morris to Walter Gropius, Penguin books, 1975
- 5. Nikolaus Pevsner, The Sources of Modern Architecture and Design, Thames & Hudson, 1985

Course content and lecture schedule

No	Торіс	No of lectures
1	Formative strands of Modern Architecture	
1.1	Neoclassicism-its transformation	1
1.2	Introduction of new material and technology – structural innovations and the evolution of large span structures.	2

1.3	Introduction of new building types and a search	1
	for an appropriate architectural style.	
1.4	Arts and crafts movement, art nouveau-	2
1.5	Works of architects like Mackintosh, Antonio Gaudi.	2
1.6	Influences from – Futurism, Expressionism, Constructivism, Destijl, Cubism, America Avant Garde,	3
1.7	Chicago school, early works F.L.Wright.	3
2	Modern Architecture	
2.1	Werkbund and Bauhaus, New conception of	2
	space –International style, CIAM.	
2.2	Works and ideas of Mies Van De Rohe, Philip	3
	Johnson, and Le Corbusier.	
2.3	Works and ideas of later works of F.L.Wright,	3
	Louis Khan, Richard Neutra,	
2.4	Eero Saarinen Oscar Neimeyer, B.Fuller, Alvar Aalto.	3
2.5	Criticism and challenges towards modern architecture.	2
3	After Modernism	
3.1	Post Modernism – Tools of new Architecture.	2
3.2	Technological advancements, Metabolism,	2
	Archigram,	
3.3	Deconstructivism.	2
4	High Tech Architecture and Architecture of	
	skyscrapers	
4.1	High tech architecture – Richard Rogers, Renzo	3

	Piano, Normen Foster.	
4.2	Evolution of skyscrapers – concepts of structural design, technological applications,	2
4.3	Stylistic evolution through contemporary examples.	2
	TOTAL NUMBER OF PERIODS	40

1. P.Shabitha

P.Shabitha
 I.Chandramathy

psarch@tce.edu icarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA43	2	-	-	2

ARA43 **BUILDING CODES AND PRACTICES**

Preamble:

Architectural practices in India is predominantly governed by various Building codes standards and regulations. It is imperative for students of Architecture to get acquaintance with the prevailing Building Codes and Regulations for better design process and practices.

Program Outcome addressed:

- a. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- b. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- c. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Recognize the relevance of building codes in practice.
- 2. Understand the implications of NBC in building practices.
- 3. Apply appropriate standards and codes in building design.
- 4. Analyse and decipher International Building Standards and codes.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	30	30	30
3	Apply	10	10	10
4	Analyse	30	30	30
5	Evaluate	-	-	-
6	Create	-	-	-

Concept Map:



Syllabus:

Introduction to Building codes - Introduction to Building codes of practices in India- various organizations involved – Types – Classifications - NBC, BIS, IGBC, LEED, EIA, MOEF, CZR etc. **NBC 2005** Salient features of NBC 2005- National Building Code 2005- Definitions, Contents, Specifications and Applications **Development Control rules**- Code for DCR and general Building requirements –

IS codes for Interiors- code for Architectural and Building drawing. **Safety considerations in NBC** - Safety considerations in NBC - Code for Building services- plumbing services - Code for construction Practices and Safety, code for fire and life safety. **International building codes**- UK, USA- AIA Standards, EUROPE-ASHRAE

Text Books:

- 1. Building Codes Illustrated: A Guide to Understanding the 2009 International Building Code / Edition 3 by Francis D. Ching.
- 2. National Building Code 2005, Bureau of Indian Standards, 2005, www.bis.org.in/.
- 3. IS Codes, Bureau of Indian Standards, 2005, www.bis.org.in.

Reference Books:

- 1. Indian Standard Code (All IS codes) of Construction and Civil Engineering
 - ASHRAE Building Code.
- 2. Building Codes Illustrated for Healthcare Facilities: A Guide to Understanding the 2006 International Building Code, by Winkel.

S. No	Торіс	No of
		lectures

1	Introduction to Building codes	
1.1	Introduction to Building codes of practices in India	3
1.2	Various organizations involved types – classifications- NBC, BIS,IGBC,LEED,EIA, MOEF,CZR etc	3
2	NBC 2005	
2.1	Salient features of NBC 2005	2
2.2	National Building Code 2005	1
2.3	Definitions, contents, specifications and applications	1
3	Development Control rules	
3.1	Code for DCR and general Building requirements	2
3.2	IS codes for Interiors	1
3.3	Code for Architectural and Building drawing	1
4	Safety considerations in NBC	
4.1	Safety considerations in NBC	3
4.2	Code for Building services	2
4.3	plumbing services- code for construction Practices and safety	2
4.4	Code for fire and life safety	2
5	International building codes	
5.1	UK, USA- AIA Standards, EUROPE-ASHRAE	3
	Total Number of Periods	26

1. Prof. V. Balasubramanian – vbsarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA44	2	-	3	3

ARA44 STRUCTURES AND CONSTRUCTION - III

Preamble:

This course aids in the structural understanding of steel as a material in the building industry. The widespread use of steel in a variety of structural members in the construction industry has necessitated a proper understanding of the design and detailing procedures adopted by design engineers. This knowledge contributes to the design and detailing skills of the student.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Discern the interaction between structural analysis and design.
- 2. Understand basic structural behavior and load transfer mechanisms of different building elements.
- 3. Apply the basic design principles learned in class to building design.
- 4. Determine and analyse the external and internal forces in the structural members.
- 5. Evaluate the basic analysis and design of the structural elements.

6. Create a workable solution for the structural system in the design process.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	10	10	10

Concept Map:



Syllabus:

STEEL SECTIONS AND JOINTS: Introduction to Steel Structures and Steel Sections - Types of Steel Sections available in market - Rolled steel sections, properties and uses - Types of Steel Joints : Riveted joints, Bolted joints, Welded joints. **RIVETED JOINTS AND BOLTED JOINTS:** Introduction to Riveted joints - Failure of a riveted joint - Design of simple riveted joint for tension and compression - Bolted joints - Failure of a bolted joint - Design of simple bolted joints for tension and compression – Design of eccentric joints. WELDED JOINTS: Different types of weld – strength of a welded joint – value of a weld – Design of simple joints under tension and compression – design of eccentric joint. Drawings : Steel Joints and Connections. **DESIGN OF STEEL BEAMS:** Introduction to Structural Steel Framing and Steel Spanning Systems - Steel Beams and Girders : Steel sections and Connections in Beams – Design of simple laterally supported beams using I Sections and channel sections - Design of compound girders. DESIGN OF COLUMNS: Steel sections and Connections in Columns: Compound and Composite Columns - Column behaviour under axial load – end conditions – slenderness Ratio – permissible stress – Design using simple section – Design of column bases. Drawings: Steel in Foundation, Beams, Columns, Staircases. DESIGN OF TRUSS: Steel sections and Connections in Trusses - Different types of trusses - Sections used for trusses - Analysis and design of simple truss - Example for design of individual elements of a truss and design of joints. Drawings : Types of Trusses, Connections of various members of Truss.

Text Books:

- 1. Dr.Ram Chandra, "Design of steel structures", Vol I, Standard book house, Delhi, 1992.
- 2. M.Raghupathy, "Design of steel Structures", Tata McGraw Hill PublishingCompany Itd. New Delhi, 1995.

Reference Books:

- Francis D.K. Ching, Barry S. Onouye, Douglas Zuberbuhler, "Building Structures Illustrated – Patterns, Systems and Design", John Wiley & Sons, Inc., 2009.
- 2. Boris Bresler, T.Y.Lin, "Design of steel Structures", Wiley Eastern Pvt., Ltd., New Delhi, 1970.
- 3. P.Dayaratnam, "Design of steel Structures", Wheeler & Co Ltd., Allahabad, 1987.
- 4. Teaching resourece for structural steel design, Volume 1,2,3. INSDAG, Kolkatta, 2000.
- 5. A.S.Arya, "Structural Design in steel, Masonry and Timber", Nemcan d& Sons, Roorkee (U.P), 1978.

IS Codes:

- 1. IS 816: 1969 Code of practice for use of Metal Arch Welding for general construction in Mild steel.
- 2. IS: 800: 2000 Code of practice for General Construction in steel
- 3. SP 6: Part 1: 1964 Handbook for Structural Engineers Part 1: Structural steel sections

Course content and lecture schedule:

No	Topic	No of
		lectures
1.0	Steel Sections and Joints :	
1.1	Introduction to Steel Structures and Steel Sections -	
	Types of Steel Sections available in market - Rolled	2
	steel sections, properties and uses.	
1.2	Types of Steel Joints : Riveted joints, Bolted joints,	2
	Welded joints	L
2.0	Riveted and Bolted Joints :	
2.1	Introduction to Riveted joints – Failure of a riveted joint	2
2.2	Design of simple riveted joint for tension and	3
	compression.	
2.3	Bolted joints and Failure of a bolted joint.	2
2.4	Design of simple bolted joints for tension and	3
	compression	
2.5	Design of eccentric joints	2
3.0	Welded Joints :	
3.1	Introduction to Welded joints, Different types of weld.	2
3.2	Strength of a welded joint; value of a weld.	1
3.3	Design of simple joints under tension and compression	3
3.4	Design of eccentric joint.	3
3.5	Drawings : Steel Joints and Connections	3
4.0	Design of Steel Beams:	

4.1	Introduction to Structural Steel Framing and Steel	3
4.2	Steel sections and Connections in Beams	3
4.3	Design of simple laterally supported beams using I-	3
	sections and channel sections	
4.4	Design of compound girders	3
5.0	Design of Columns:	
5.1	Steel sections and Connections in Columns : Compound	2
	and Composite Columns	
5.2	Column behaviour under axial load - end conditions -	3
	slenderness Ratio – permissible stress	
5.3	Design using simple section	3
5.4	Design of column bases.	3
5.5	Drawings: Steel in Foundation, Beams, Columns, Staircases	4
6.0	Design of Truss:	
6.1	Steel sections and Connections in Trusses	2
6.2	Different types of trusses, steel sections used for trusses.	2
6.3	Analysis and design of simple truss.	3
6.4	Example for design of individual elements of a truss and design of joints.	4
6.5	Drawings : Types of Trusses, Connections of various members of Truss.	4
	Total Number of Periods	70

- 1. K. Arunachallam
- 2. K. Sudalaimani

karcivil@tce.edu ksciv@tce.edu

- 4. J. Jinu Louishidha Kitchley
- 5. P. Kabila Sri

jinujoshua@tce.edu kabilasri@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA45	2	-	2	4

ARA45 Building Services and Technology I

Preamble:

Architecture is both the process and product of planning, designing and constructing form, space and ambience that reflect functional, technical, social and aesthetic considerations. It requires the creative manipulation and coordination of material, technology etc. Architecture has to define the structure and /or behavior of building or any other kind of system that is to be constructed. Building services in modern buildings involves the design, installation, operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmentally friendly operations. This course has been designed to understand the basic concepts and system of various services involved in modern buildings. In this course the services involve the study of water distribution, sanitation, sewage treatment, sewage disposal storm water for drainage.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competency:

On completion of this course, the students will be able to

- 1. Retain knowledge about Water quality and Treatment, Water Distribution
- 2. Understand the relationship between different Domestic water supply systems.
- 3. Relate the Rural and Urban Sanitation systems.

- 4. Analyse the arrangement of sewerage systems, water distribution systems in Housing, large factories, towns and cities.
- 5. Assess different methods of water distribution.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	20	20	20
4	Analyse	20	20	20
5	Evaluate	20	20	20
6	Create	-	-	-

Concept Map:



SyllWater Quality, Purification And Treatment - Surface and ground water sources-quality /quantity-nature of impurities – hard and soft water treatmentswater supply systems- sedimentation-water supply project. Sand filtration-sand filters-rapid sand filters-pressure filters- sterilization and disinfections. Water Distribution - Demand of water for domestic, commercial, industrial and public utility purposes as per BIS standards. Per capita demand, leakage and wastage of water and its preventive measures. Storage and Distribution of Water - Different methods of water distribution boosting water, gravity and pressure distribution by storage tanks of individual buildings. Domestic water supply systems, sump, overhead tank, pipe size, pipe fittings. types of taps, types of valves etc. Distribution systems in small towns-types of pipes used-Laying, jointing ,testingprevention of water wastage and reuse of water-Internal water supply in buildings- Cold water and hot water supply for multistoried buildings, Municipal byelaws and regulations. Sanitation - Importance; refuse types; collection and disposal. Materials and construction details of sewers and connection- testing for water tightness-plumbing system for building types. Workmanship, cleaning of sewers; ventilation of sewers; sewer recycling of water. Basic principles of sanitation and disposal of waste water from buildings. Sewage Treatment and Sewerage Systems - a) A brief on sewage treatment, septic tanks, oxidation ponds, soak pits, aqua privy, manholes, inspection chambers, intercepting chamber, cast iron manholes, Self cleansing velocity, drains on sloping sites, subsoil drainage, garage drainage and layout of simple drainage systems and testing of drains. b) Environmental sanitation-sanitation in buildings. Primary and secondary treatment -Activated sludge-Intermittent and tickling sand filters-Arrangement of sewerage systems in Housing, large factories, towns and citiessewage pumping station-Rainwater disposal and storm water drainage from buildings.

c) Refuse Disposal: Collection, conveyance and disposal of town refuse systems. **Urban and Rural Sanitation-Storm Water Drain-Refuse Disposal -**Urban and rural drainage and sanitation, different collection and disposal systems. Site planning from drainage point of view. Connection of house sewers to municipal sewers, ventilation of sewers. Sanitation in unsewered areas, fairs – alignment of storm water drains in housing layout and cities-collection, conveyance and disposal of town refuse.

Text Books:

1. S.C.Rangwala, Water Supply and Sanitary Engineering, Charaotar Publishing House, Anand 388601.1989.

Reference Books:

1. G.M,Fair, J.C.geyer and D.Okun,Water and Waste Water Engineering.Vol.II.John Wiley & sons,Inc.,New York,1968.

2. Manual of Water Supply and Treatment, Second Editions, CPHEEO, Ministry of works and Housing. New Delhi1977

3. Mannual on Sewerage and Sewage Treatment, CPHEEO, Ministry of Works and Housing.New Delhi.1980.

Course content and lecture schedule

No.	Торіс	No of
		lectures
1.1	Surface and ground water sources-quality /quantity	2
1.2	Nature of impurities – hard and soft water treatments	2
1.3	Water supply systems- sedimentation-water supply project.	2
1.4	Sand filtration-sand filters-rapid sand filters- pressure filters- sterilization and disinfections	3
2	Water Distribution	
2.1	Demand of water for domestic, commercial, industrial and public utility purposes as per BIS	2

	standards	
2.2	Per capita demand, leakage and wastage of water	2
	and its preventive measures.	
2.3	Storage and Distribution of Water - Different	2
	methods of water distribution boosting water,	
	gravity and pressure distribution by storage tanks	
	of individual buildings.	
2.4	Domestic water supply systems, sump, overhead	2
	tank, pipe size, pipe fittings. Types of taps, types	
	of valves etc	
2.5	Distribution systems in small towns-types of pipes	2
	used-Laying, jointing, testing-prevention of water	
	wastage and reuse of water-Internal water supply	
	in buildings-	
2.6	Cold water and hot water supply for multistoried	2
	buildings, Municipal byelaws and regulations.	
3	Sanitation	
3.1	Basic principles of sanitation and disposal of waste water from buildings. Importance; refuse types; collection and disposal.	2
3.2	Materials and construction details of sewers and	2
	connection- testing for water tightness-plumbing	
	system for building types	
3.3	Workmanship, cleaning of sewers; ventilation of	2
	sewers; sewer recycling of water	
4	Sewage Treatment and Sewerage Systems	
4.1	A brief on sewage treatment, septic tanks, oxidation ponds, soak pits, aqua privy, manholes,	

	inspection chambers, intercepting chamber, cast iron manholes.	3
4.2	Self cleansing velocity, drains on sloping sites, subsoil drainage, garage drainage and layout of simple drainage systems and testing of drains	2
4.3	Environmental sanitation-sanitation in buildings. Primary and secondary treatment –Activated sludge-Intermittent and tickling sand filters	2
4.4	Arrangement of sewerage systems in Housing, large factories, towns and cities-sewage pumping station-Rainwater disposal and storm water drainage from buildings.	3
4.5	Refuse Disposal: Collection, conveyance and disposal of town refuse systems.	2
5	Urban and Rural Sanitation-Storm Water Drain-Refuse Disposal	
5.1	Urban and rural drainage and sanitation, different collection and disposal systems.	2
5.2	Site planning from drainage point of view. Connection of house sewers to municipal sewers, ventilation of sewers.	2
5.3	Sanitation in non sewered areas, fairs – alignment of storm water drains in housing layout and cities-collection, conveyance and disposal of town refuse	2

1. S.Karthikeya Raja

2. P.Vivek

skrarch@tce.edu pvkarch@tce.edu 3. S.Santhana Iyyappa Sundararaj ssiarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA46A	1	2	2	4

ARA46A Energy Efficient Architecture

Preamble:

Energy efficiency is the need of the hour in the global as well as native scenario. Buildings being the major contribution to the demand for energy resources, it is compulsory for an Architect to be sensitive to this issue. Architectural education and the profession to be responsive and effective have to probe into energy efficiency science principles and systems for designing a better future. This course is designed to apply engineering science principles for analysis and design of energy efficient systems for maintaining a comfortable, healthy and productive indoor Environment in Buildings.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.

- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- e. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

On completion of this course, the students will be able to

- 1. Retain knowledge about various factors that influence energy consumption.
- 2. Understand the relationship between different active and passive techniques.
- 3. Relate the energy efficient systems to the context.
- 4. Analyse the site, climate, resources and the techniques for saving energy.
- 5. Assess different methods of energy efficient technologies.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	-	-	-

Concept Map:



Syllabus:

Introduction to Energy Efficient Architecture: Need for energy efficiency in buildings. Sources of energy-renewable and non renewable. Definitions-embodied

energy, energy conservation, energy efficiency, zero energy buildings, net zero buildings, green buildings, sustainable buildings Climate responsive design features adopted in the Traditional/ Vernacular architecture of various places in different climatic zones. Case study analysis of energy efficient features in traditional/vernacular buildings. Energy efficient site planning: Micro climate -Influence of land form, built form, open space, Topography, orientation, vegetation, water bodies. Planning for solar access - maximizing day lighting. Examples-orientation, landscape, ventilation principles. Design considerations depending on climate zones of India. Built form and Built envelope: Building envelope, massing - facade articulation, finishes - appropriate use of building materials in historic building. Plan form & Elements - Roof form - Fenestration pattern & Configuration. Heating & cooling loads - Energy estimates. Exercises on heating and cooling load calculations and analysis for a live case study (office room etc.,) to determine the energy efficiency. Passive and active cooling / heating: Passive cooling / Passive Heating - Theories and Principles -Evaporative cooling, Nocturnal radiation cooling, Passive Dessicant cooling, induced ventilation, earth sheltering, Berming, Wind Towers, earth - Air tunnels, Curved Roofs & Air Vents, Insulation, Vary Thermal wall etc. Case studies on buildings designed with passive cooling techniques.. Case studies on buildings using active and passive cooling techniques- Theories and principles - Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, Roof radiation trap, Solarium, Solar Water heating etc - Isolated gain systems -Natural convective loop etc. Case studies on buildings using active and passive heating techniques. Advancements in active systems technology for energy efficiency. Introduction to tools for evaluation of building performance Introduction to energy management systems. Types of energy auditing and their significance. Role of thermal imaging systems. Introduction to energy simulation programs- Introduction to Energy star labels. Getting to know energy audit softwares and calculation methods.

Total no of periods: 70

Text Books:

1. Fuller Moore, Environmental Control systems, Mcgraw Hill, Inc., New Delhi, 1993

2. A. Konya Design Primer for Hot Climates, Architectural press, London, 1980.

3. O.H.Koenigsberger and others, Manual of Tropical Housing and Building-Part-I-Climatic Design, Longmans, London, 1980.

4. B.Givoni, Man, Climate and Architecture, Applied Science, Banking, Essex, 1982.

Reference Books:

- 1. Climatically responsive Energy efficient architecture, PLEA/SPA, New Delhi 1995.
- 2. Ms.Sudha, NK .Bansal and M.A.S Malik Solar Passive Building Pergamon Press.
- 3. V.Gupta Energy and Habitat Wiley Eastern limited, New Delhi.
- 4. Mili Majunder, Teri Energy Efficient Bldg in India, Thomson Press, New Delhi, 2001

5. J.K Nayak & Others, Energy Systems Energy Group, Is a Annual Of Passive Solar

Architecture.

- 6. Arvind Krishnan & Others, Climate Responsive Architecture, Tata Mcgraw Hill New Delhi 2001.
- 7. Energy performance of buildings, George Baird, CRC Press
- 8. Thermal Control of Passive Solar Buildings, S.C.Kaushik, G.N.Tiwari, J.K.Nayak, IBT Publishers & Geo Environment Academy
- 9. Solar Energy Applications and Buildings, Laura C.Zeiber, Whitney Library of Design

10. Energy Simulation in Building Design, J.A.Clarke, Adam Milger Ltd. (1985). Course content and lecture schedule

No	Торіс	No of
		lectures
1	Introduction to Energy Efficient Architecture	
1.1	Need for energy efficiency in buildings.	2
1.2	Sources of energy-renewable and non renewable.	1
1.3	Definitions-embodied energy, energy conservation, energy efficiency, zero energy buildings, net zero buildings, green buildings, sustainable buildings	1
1.4	Climate responsive design features adopted in the Traditional/ Vernacular architecture of various places in different climatic zones.	2
1.5	Case study analysis of energy efficient features in traditional/vernacular buildings.	4
2	Energy efficient site planning	
2.1	Micro climate – Influence of land form, built form, open space, Topography, orientation, vegetation, water bodies.	2
2.2	Planning for solar access - maximizing day lighting. Examples-	1
2.3	Examples- orientation, landscape, ventilation principles.	1
2.4	Design considerations depending on climate zones of	2
	India.	
3	Built form and Built envelope	

3.1	Building envelope, massing - façade articulation,	2
3.2	Finishes - appropriate use of building materials in historic building.	2
3.3	Plan form & Elements – Roof form	2
3.4	Fenestration pattern & Configuration.	2
3.5	Heating & cooling loads	3
3.6	Energy estimates	3
3.7	Exercises on heating and cooling load calculations and	4
	analysis for a live case study (office room etc.,) to	
	determine the energy efficiency.	
4	Passive and active cooling / heating	
4.1	Passive cooling – Theories and Principles –	1
4.2	Evaporative cooling, Nocturnal radiation cooling, Passive Dessicant cooling, induced ventilation,	2
4.3	Earth sheltering, Berming, Wind Towers, earth – Air tunnels, Curved Roofs & Air Vents, Insulation, Vary Thermal wall etc.	2
4.4	Case studies on buildings designed with passive cooling techniques	2
4.5	<i>Case studies on buildings using active and passive cooling techniques</i>	3
4.6	Passive Heating – Theories and principles	1
4.7	Direct gain systems - Glazed walls, Bay windows, Attached sun spaces etc.	1
4.8	Indirect gain systems – Trombe wall, Water wall, Solar Chimney, Transwall, Roof pond, Roof radiation trap, Solarium, Solar Water heating etc - Isolated gain systems – Natural convective loop etc.	2
4.9	Case studies on buildings using active and passive heating techniques Advancements in active systems technology for energy efficiency.	4
5	Introduction to tools for evaluation of building performance	
5.1	Introduction to energy management systems. Types of energy auditing and their significance. Introduction to Energy star labels.	2

	Total number of periods	70
5.5	Getting to know energy simulation programs related to energy in buildings	7
5.4	Getting to know energy audit softwares	7
5.3	Introduction to energy simulation programs-	1
5.2	Role of thermal imaging systems.	1

- J. J.Jinu Louishida Kitchley
 R.ShanthiPriya
- 3. A.Madhumathi
- 4. I.Chandramathy

jinujoshua@tce.edu rsparch@tce.edu madhu@tce.edu icarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA46B	1	2	2	4

ARA46B Interior Design

Preamble:

Architecture is about living spaces and Interior design addresses several issues in the living space. Interiors have to be treated distinctly based on the function, activity, gender, age etc. This course is designed to help the student to design interiors which would be responsive to the user and activity.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- c. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- e. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

On completion of this course, the students will be able to

- 1. Retain knowledge about various factors that influence Interior detailing.
- 2. Understand the functional and aesthetic aspects of architecture.
- 3. Relate the principles of visual and spatial composition.
- 4. Analyse the context and requirements for detailing the interiors.
- 5. Comprehend the architect's role in an interior design process.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	20	20	20
5	Evaluate	10	10	10
6	Create	-	-	-

Concept Map:



Syllabus:

Introduction and History of interior design - Definition of interior design - interior design process - vocabulary of design in terms of principles and elements - Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - study and design. Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc. - Brief study of folk arts and crafts, vernacular design in India with reference to interior design and decoration. Elements of Interior Design - Enclosing Elements - Introduction to various elements in interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc. and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects - Design projects on elements of interiors -Various types of construction materials - characteristics - advantage and disadvantage – methods of construction – innovative materials – market trend – various products- Cost - - Exercises on Enclosing elements - Elements of Interior Design - Lighting & Environmental Systems - Study of interior lighting - different types of lighting, their effects, types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors - paintings, objects de art, etc.- Environmental Systems- HVAC, Fire Fighting etc.- Cost - Exercises on Lighting & Environmental Systems Elements of Interior Design - Furnishings & Furniture - Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort, function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. - Design projects on furniture design-Cost -Exercises on Furnishings and furniture - Elements of Interior Design -Interior-scaping & Project - Elements of Interior-scaping- Rock, Plants & Water-Properties and Applications-Roof Gardens-Balcony Gardens-Vertical Gardens- Design Considerations of Interiorscaping in Projects such as Residences, Offices, Commercial Complexes, Hotels etc. - Project: Design interiors for small building such as residence, shops etc. Design the Elements of Interior Exercises -Design and give specifications for the Enclosing Elements and Finishes. Suggest the trade names of the materials-Estimation and Cost Analysis.

Total no of

periods: 70 Text Books:

1 1.Francis D.K.Ching, Interior Design Illustrated, V.N.R. Pub. NY 1987. **Reference Books:**

1. An Invitation to design, Helen Marie Evans.

2. Steport - De - Van Kness, Logan and Szebely, Introduction to Interior Design Macmillan Publishing Co., NY 1980.

3. Julius Penero and Martin Zelnik, Human Dimensions and Interior space Whitney Library of Design, NY 1979.

4. Inca/Interior Design Register, Inca Publications, Chennai 1989.

Course content and lecture schedule

No	Торіс	No of
		lectures
1	Introduction and History of interior design	
1.1	Definition of interior design - Interior design process.	1
1.2	Vocabulary of design in terms of principles and elements.	1
1.3	Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - study and design.	2
1.4	Brief study of the history of interior design through the ages relating to historical context, design movements and ideas etc.	5
1.5	Brief study of folk arts and crafts, vernacular design in India with reference to interior design and decoration.	2
2	Elements of Interior Design - Enclosing Elements	
2.1	Introduction to various elements in interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc.	3
2.2	Various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.	3

2.3	Design projects on elements of interiors	2
2.4	Various types of construction materials -	5
	characteristics - advantage and disadvantage -	
	methods of construction - innovative materials -	
	market trend – various products- Cost - Exercises	
3	Elements of Interior Design – Lighting &	
	Environmental Systems	
3.1	Study of interior lighting - different types of lighting, their effects, types of lighting fixtures.	2
3.2	Other elements of interiors like accessories used for enhancement of interiors - paintings, objects de art, etc.	1
3.3	Environmental Systems- HVAC, Fire Fighting etc Cost	2
3.4	Exercises on Lighting & Environmental Systems	5
4	Elements of Interior Design – Furnishings &	
	Furniture	
4.1	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.	2
4.1	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.Function, materials and methods of construction	2
4.1 4.2 4.3	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort. Function, materials and methods of construction changing trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc.	2 2 3
4.1 4.2 4.3 4.4	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.Function, materials and methods of constructionchanging trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc.Design projects on furniture design-Cost	2 2 3 5
4.1 4.2 4.3 4.4 4.5	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.Function, materials and methods of constructionchanging trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc.Design projects on furniture design-CostExercises on Furnishings and furniture	2 2 3 5 5
4.1 4.2 4.3 4.4 4.5 5	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.Function, materials and methods of constructionchanging trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc.Design projects on furniture design-CostElements of Interior Design – Interior-scaping & Project	2 2 3 5 5
 4.1 4.2 4.3 4.4 4.5 5 5.1 	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort. Function, materials and methods of construction changing trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. Design projects on furniture design-Cost Elements of Interior Design – Interior-scaping & Project Elements of Interior-scaping- Rock, Plants & Water-Properties and Applications-Roof Gardens-Balcony Gardens-Vertical Gardens	2 2 3 5 5 2
 4.1 4.2 4.3 4.4 4.5 5 5.1 5.2 	Furnishing- Furniture-Study of relationship of furniture to spaces and human movements furniture design as related to human comfort.Function, materials and methods of constructionchanging trends and lifestyles, innovations and design ideas - study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc.Design projects on furniture design-CostElements of Interior Design – Interior-scaping & ProjectElements of Interior-scaping- Rock, Plants & Water- Properties and Applications-Roof Gardens-Balcony Gardens-Vertical GardensDesign Considerations of Interiorscaping in Projects such as Residences, Offices, Commercial Complexes, Hotels etc.	2 2 3 5 5 5 2 2
Design and give specifications for the Enclosing Elements and Finishes. Suggest the trade names of the materials-Estimation and Cost Analysis.		
--	----	
Total number of periods	70	

- 1. R.ShanthiPriya
- 2. A.Madhumathi
- 3. I.Chandramathy

rsparch@tce.edu madhu@tce.edu icarch@tce.edu

Subject code	Lecture	Tutorial	Practice	Credit
ARA47	-	-	14	7

ARA47 ARCHITECTURAL DESIGN III

Preamble:

The process of architectural design is multi dimensional and involves numerous factors such as function, activities, spatial requirements, circulation, aesthetic aspects etc. This architectural design studio undertakes comprehension of spaces from multiple user and multiple units in multiple level planning, site planning aspects, planning for disability, rural settlement growth aspects, cultural and contextual knowledge of materials, construction techniques.

Program Outcome:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competencies:

On completion of this course, the students will be able to

- 1. Recognize the various standards, functional activities and hierarchy of activities in multiple user, multiple units and multiple level building plans.
- 2. Comprehension of the issues involving site planning, planning for disability, rural settlement growth aspects, cultural and contextual knowledge of materials, construction techniques.
- 3. Correlate various influencing factors of a design such as function, activities, spatial standards, form, volumetric definition, etc.
- 4. Analyse a design question and the formulation of the problem

- 5. Design spaces involving multiple users, multiple units and multiple level building plans.
- 6. Design spaces involving cultural and social aspects.

Syllabus:

Exercises involving multiple user and multiple units with multiple level movement such as Speciality clinics, Museum, Art centers, Rehabilitation centers etc. Understanding of rural settlement patterns and Various rural materials and const techniques. – data collection, analysis and documentation. Application of acquired knowledge in a simple design problem.

References:

- 1. De Chiara and Callender, Time-Saver Standards for Building Types, Mc Graw Hill Co., New York, 1973
- 2. Nufert Ernst, Architects Data, Blackwell Science Ltd., Britain, 1980
- 3. Pattern Language
- 4. Sir Christopher Alexander, Timeless way of building
- 5. Julius Panero, Martin Zelick, Human Dimension and Interior Space, Whitney Library of Design, Canada, 1979

Course contents and exercise schedule

No.	Торіс	No. of exercise hours
1.0	Minor project relevant to the design competency aimed at this semester	14
2.0	Exercises involving multiple user and multiple units with multiple level movement such as Specialty clinics, Museum, Art centers, Rehabilitation centers etc	
2.1	Group study, Literature analysis, Standards and Case studies - Presentation of study and group discussion	14
2.2	Site planning aspects, planning for disability, Site Zoning, Activity analysis, Building level activity zoning - Concept generation	14
2.3	Generation of scheme drawings- Circulation pattern, Furniture layout, site planning aspects, planning for disability.	17
2.4	Presentation	14
3	Understanding of rural settlement patterns and various rural materials and const techniques. – Data collection, analysis and documentation.	
3.2	Group study, Literature analysis, Standards and Case studies, Study methodology formulation- On site visit - Study -Documentation -Presentation of study	70
3.3	Analysis of data and future prospects- Group discussion	35
3.4	A design problem relevant to the context - Conceptual Design generation	21
	TOTAL NUMBER OF PERIODS	196

Course Designers:

1. V. BalaSubramaniam

2. S.RadhaKrishnan

vbsarch@tce.edu srkarch@tce.edu

- G.Balaji
 Jinu Louishidha Kitchley
- 5. P. Shabitha
- 6. G.Asaithambi

gbarch@tce.edu jinujoshua@tce.edu psarch@tce.edu gaarch@tce.edu

RA51 SPECIFICATION AND ESTIMATION

2:0

Preamble:

Building Estimate and Specification is very essential for Architectural Design to be realized in practice. This subject introduces various items of work and its specification, the cost and quantity estimation process and the analysis of rates of different items of work in buildings.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 6. Knowledge about various items of work.
- 7. Comprehension about the process of estimation.
- 8. Estimation of cost and quantity.
- 9. Analysis of rates.

Blooms Category Test 1 Test 2 Test 3 / End semester Examination 1 Remember 20 20 20 2 20 20 20 Understand 3 30 30 30 Apply 4 Analyse 30 30 30 5 Evaluate 0 0 0 0 0 0 6 Create

Assessment Pattern:

Concept Map:



Syllabus:

Introduction to Estimation: Types and purpose – Approximate Estimate and Detailed Estimate of buildings - Measurement of basic materials like brick masonry, stone masonry, P.C.C, R.C.C, Woodwork, according to Bureau of Indian Standards. Specifications and specification writing for various items of work: Various items of works for different types of buildings –types of

specification- writing specifications for the purpose of calling tenders – Specification for foundation earth work Brick work- concrete work-RCC work - Plastering –Flooring –Wood work – Finishes. **Rate analysis:** Schedule of rates of Tamil Nadu for various items of work and labour - Rate analysis for earth work – P.C.C – Brick Work – R.C.C – Plastering – Flooring. **Detailed estimate:** Quantity Estimate for all items of work involved in simple buildings - Preparation of Detailed Estimate using computer tools. **Budgeting:** Financing of projects-economic feasibility report –valuation –depreciation and its implication.

Text books:

1. Dutta S, Estimating and Costing, S.Dutta and Co., Lucknow, 1998

2. S.C.Rangwala, Elements of Estimating and Costing, Charoter Publishing House, India,

1996.

Reference Books:

- 7. W.H.King and D.M.R.Esson, Specification and Quantities for Civil Engineers, The English University Press Ltd, 2000.
- 8. T.N.Building Practice, Vol.1, Civil, Govt. Publication, 1990.
- 9. P.W.D. Standard specifications, Govt. Publication, 1995.

Course content and lecture schedule:

S.No.	Торіс	No. of
		lectures
1	Introduction to Estimation	
1.1	Types and purpose	1
1.2	Approximate Estimate and Detailed Estimate of buildings	1
1.3	Measurement of basic materials like brick masonry, stone	2
	masonry, P.C.C, R.C.C, Woodwork, according to Bureau of	
	Indian Standards.	
2	Specifications and specification writing for various	
	items of work:	
2.1	Various items of works for different types of buildings	1
2.2	Types of specification- writing specifications for the	
	purpose of calling tenders	1
2.3	Specification for foundation earth work Brick work-	
	concrete work-RCC work - Plastering -Flooring -Wood	4

S.No.	Торіс	No. of
		lectures
	work – Finishes	
3	Rate analysis:	
3.1	Schedule of rates of Tamil Nadu for various items of work and labour	2
3.2	Rate analysis for earth work – P.C.C – Brick Work – R.C.C – Plastering – Flooring.	2
4	Detailed estimate:	
4.1	Quantity Estimate for all items of work involved in simple buildings	2
4.2	Preparation of Detailed Estimate using Computer tools	6
5	Budgeting:	
5.1	Financing of projects-economic feasibility report	2
5.2	Valuation –Depreciation and its implication	2
	TOTAL	26

- 3. Sanjay Kumar sanjay@tce.edu
- 4. Jinu Louishidha Kitchley jinujoshua@tce.edu
- 3. P. Kabilasri

kabilasri@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA52	3	-	-	3

ARA52 HISTORY OF MODERN ARCHITECTURE II 3:0

Preamble:

The critical re-examination of modern architecture of the 20th Century led to Critical Regionalism. It is an approach in architecture that strives to counter lack of identity in Modern Architecture by utilizing the building's geographical context. The study of critical regionalism enables the student to understand the responses of various architects around the world to mediate the spectrum between universal civilization and the particularities of place. Similarly in the architecture of Post independence India the centre of attention shifted from religion and royal concerns to the common man, his environment and needs.

Program Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Gain Information about the alternative building technology practiced by various architects.
- 2. Understand the interpretations of function and culture in architecture.
- 3. Analyse the works of Pioneering Indian Architects.
- 4. Evaluate the emerging Architectural trends in India.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	0	0	0

Concept Map:



Syllabus:

Critical Regionalism and reflective practices: Concept of critical regionalism, the need of reflective practices – culture, climate local resources. Ideas and works of Hassan Fathy, Geoffrey Bawa, Paolo Soleri, Tadao Ando, Laurie Baker. **Post independent Architecture in India**: Implications of freedom – Gandhian and Nehruvian visions of development. Post independence city planning, architecture of Le Corbusier, Habib Rahman, and Louis Kahn in India. **Contemporary architecture in India**: Works and ideas of Kanvinde, Raje, B.V. Doshi, Charles Correa, Nari Gandhi, Raj Rewal, Christopher Beninger, Stein. **Regional Contemporary architecture:** Concepts and works of south Indian architects on - Institutional and Industrial projects, government projects, contemporary spatial planning, Energy efficiency and eco friendly architecture, vernacular and traditional architecture. **Alternative Regional Practices:** Housing and the issues of appropriate technology- Regional Alternate Practices of institutions such as HUDCO, Auroville, Nirmithi Kendras, COSTFORD, Habitat.

Text books:

- Jon Lang, A Concise History of Modern Architecture in India, Orient Blackswan, 2002.
- Miki Desai, Architecture and Independence, Oxford University Press, New Delhi, 1998
- Robert Venturi, Complexity and Contradiction in Architecture, The Architectural Press, London, 1977

Reference Books:

- 1. Charles Jencks, The language of post Modern Architecture, 1984
- 2. Aldo Rossi, The Architecture of the city, M.I.T Press, Massachusetts, 1982

3. D.Ghirardo, Architecture after Modernism, Thames and Hudson, London, 1996 Course content and lecture schedule:

S. No.	Торіс	No. of
		lectures
1	Critical Regionalism and reflective practices	
1.1	The need of reflective practices - culture, climate local	2
	resources	
1.2	Ideas and works of Hassan Fathy, Geoffrey Bawa	2
1.3	Ideas and works of Paolo Soleri, Tadao Ando, Laurie Baker	3
2	Post independent Architecture in India	
2.1	Implications of freedom – Gandhian and Nehruvian visions	3
	of development.	
2.2	Post independence city planning, works of Le Corbusier	3
	and Louis Kahn in India	
2.3	Works and ideas of Habib Rahman	2
3	Contemporary architecture in India	
3.1	Works and ideas of Kanvinde, Raje	2
3.2	Works and ideas of B.V. Doshi, Charles Correa	2
3.3	Works and ideas of Nari Gandhi, Raj Rewal	2
3.4	Works and ideas of Christopher Beninger, Stein	1
4	Regional Contemporary architecture	
4.1	Concepts and works of architects on - Institutional and	3
	Industrial projects, government projects in south India	
4.2	Concepts and works of south Indian architects on	3
	contemporary spatial planning	
4.3	Concepts and works of south Indian architects on Energy	3
	efficiency and eco friendly architecture	
4.4	Concepts and works of south Indian architects on	3
	vernacular and traditional architecture	
5	Alternative Regional Practices	
5.1	Housing and the issues of appropriate technology	1

S. No.	Торіс	No. of
		lectures
5.2	Regional Alternate Practices of institutions such as	3
	HUDCO, Auroville	
5.3	Regional Alternate Practices of institutions such as	2
	Nirmithi Kendras, COSTFORD, Habitat.	
	TOTAL	40

- 3. P.Shabitha psarch@tce.edu
- 4. I.Chandramathy icarch@tce.edu
- 5. Jinu Louishidha Kitchley jinujoshua@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA5C	2	-	-	2

ARA5C TRADITIONAL INDIAN ARCHITECTURE

2:0

Preamble:

India is a country of rich traditional architectural wealth especially in the form of abundant temple structures spreading across the states which stands for centuries to show the world the strength of our traditional knowledge system. It is imperative for a student of architecture to understand and appreciate the philosophy and principles of Indian Architecture, which establishes the relationship between the built environment and the well being of the inhabitants.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 5. Recognize the relationship between built space, living organism and universe.
- 6. Understand the meaning of vastu and vaastu
- 7. Relate the concepts of Mandala Diagram and its significance in layout and settlement design.
- 8. Examine the traditional measurement system

 Evaluate the resultant ambience in built space using Aayadi calculation for the well being of the inhabitants.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction to Traditional Indian Architecture: Significance and Achievements of Traditional texts in India - Meaning of Vastu and Vaastu - Its classification. **Space theory :**Gross and subtle space, Macro and micro space, enclosed and material spaces - Relationship between built space, living organism

and universe - Impact of built space on human psyche. **Space & Time Interface and its Measurement :** Theory of vibration – vibration as time, equation of time and space – time space relationship and measurement of same -Units of measurement – Tala and Hastha System of measures- - Physical manifestation and symbolic embodiment of time and space in the temple form and layout. **Planning principles** :Features of good building site - good building shapes – Orientation of the building, Aayadi calculations – resultant ambience in built space, Mandala or Pada vinyasa - its types - Layout and settlement- zoning of functional areas, Proportion systems, fitting of components in the building- The cube as the basic structure - positive and negative energies. **Architectural Applications and Case Studies:** Simple design of single and multi-storeyed residential building – Basement- Wall and roof specification –Pitched roof and domical roofs - Significance of pyramid- landscaping in and around buildings. Aesthetics in Indian Architecture- Case Studies.

Text Books:

- 1. Bruno Dagens Maya Matam I & II– IGNCA publication –New Delhi 1997.
- Dr.V.Ganapati Sthapati- Vastu Shastra Vastu Vedic Research Foundation, Chennai – 1996.
- 3. Sashikala Ananth The Penguin Guide to Vaastu- Penguin Books, New Delhi, 1998.

Reference Books:

- 1. T.Ganapathi Sastri Silpa Ratnam Maharaja of Travancore, Govt of Travancore, 1922.
- 2. Stella Kramresh the Hindu Temple Vol.I & II Motilal Banarsidars Publishers Pvt.Ltd., Delhi,1994.

S. No.	Торіс	No of
		lectures
1	Introduction	
1.1	Traditional definition – achievements in India	1
1.2	Meaning of Vastu and Vaastu	2
1.3	Its classification – Relationship to earth	2
2	Space Theory	
2.1	Gross and Subtle space	1
2.2	Macro, micro, enclosed and material spaces	1

Course content and lecture schedule:

2.3	Relationship between built space, living organism and	2
	universe	2
2.4	Impact of built space on human psyche.	1
3	Space & Time interface and its Measurement	
3.1	Theory of vibration – vibration as time, equation of	
	time and space - time space relationship and	2
	measurement of same	
3.2	Units of measurement – Tala and Hastha System of	2
	measures	
3.3	Physical manifestation and symbolic embodiment of	1
	time and space in the temple form and layout.	
4	Planning Principles	
4.1	Features of Good building site and building shape,	2
	orientation of the building	
4.2	Mandala or Padavinyasa - its types-Layout and	2
	settlement- zoning of functional areas	2
4.3	Proportion Systems	1
4.4	fitting of components in the building - The cube as	1
	the basic structure - positive and negative energies	
5	Architectural Applications	
5.1	Simple design of single and multi-storeyed	
	residential building - Base - Wall and roof	2
	specification	
5.2	Pitched roof and domical roofs	1
5.3	Significance of pyramid- landscaping in and around	1
	buildings	
5.4	Aesthetics in Indian Architecture – Case studies	1
	TOTAL	26
L		I

- 1. V. BalaSubramanian vbs
- vbsarch@tce.edu

2. G.Asaithambi

gaarch@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA5D	2	-	-	2

ARA5D VERNACULAR ARCHITECTURE

2:0

Preamble:

Architecture being a multifaceted profession, it requires exposure to the essence of vernacular architecture to understand the architecture without architects. The understanding of the principles of Vernacular Architecture can be used as a design tool for the contemporary buildings across various climatic zones.

Program Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Recognize the essence of architecture of vernacular buildings and settlements.
- 2. Understand how climate influences architecture

3. Comprehension of the application of vernacularism in contemporary buildings towards sustainable built environment.

4. Analyse the climate responsiveness of vernacular buildings and settlements.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction :Definition of Vernacular Architecture - Importance and factors determining the character of Vernacular Architecture - Approaches and concepts used in Vernacular Architecture - aesthetics, anthropology, architectural, geographical, spatial, ecological, behavioural and developmental. **Vernacular Architecture in Tamilnadu:** Introduction to Vernacular cultural landform divisions of ancient Tamil –Hilly regions and hinterlands- Architectural significances in planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform – Examples -

Irula, Kurumba, Todas, Badagas, Kuchi veedus, Chettinadu houses, Agraharams, Courtyard houses etc. **Vernacular Architecture of South India:** Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform. Boat Houses of Kerala-Introduction, Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform. Andrapradesh – architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform. Culture, traditions, value systems, climate and landform. **Vernacular Architecture of North India:** Rajasthan- Traditional havelies in Rajasthan- Climate, Materials, Construction details, settlement planning of Jaipur. Gujarat- Kutch- Wooden Houses and Mansions of Gujarat, their primitive form, climate, Materials and construction details and architecture of Banni Houses in Kutch regions.

Text books:

 Paul Oliver, Encyclopedia of Vernacular Architecture of the World, Cambridge
 University Press, 1997

University Press, 1997.

- 2. Taylor and Francis, Vernacular Architecture in the 21st century, 1999.
- 3. Sanjay Udamale, Architecture for Kutch, English edition, 1980

References:

- 1. Channa Daswate, Dominic Sansoni, Srilanka style Tropical design and Architecture, Periplus Edition, 2006.
- 2. S.Muthiah, Meenakshi Meyappan, Visalakshy Ramasamy The Chettiar Heritage –published by The Chettiar Heritage.
- 3. Madhavi Desai Traditional Architecture , published by the The Bombay Presidency Gazetteer 2007
- 4. Ilay Cooper Barry Dawson, Traditional Buildings of India, Thames and Hudson (1998).
- 5. Traditional and Vernacular Architectue- madras craft foundation ltd.
- 6. R. Champakalakshmi, Usha Kris, Architecture of the Indian Desert, Luster press- Rolli books.

Course content and Lecture schedule:

S. No.	Io. Topics	No.	of
		Lectures	
1.	Introduction		

1.1	Definition of Vernacular Architecture. Importance and	2
	factors determining the Character of vernacular	
	Architecture	
1.2	Approaches and concepts used in vernacular	2
	Architecture - Aesthetic, Anthropology	
1.3	Architectural and Geographical approach	2
1.4	Spatial and Ecological approach	2
1.5	Behavioural and developmental approach	2
2.	Vernacular architecture in Tamil Nadu	
2.1	Introduction to Vernacular cultural landform divisions of	2
	Tamilnadu – Hilly regions and Hinterlands	
2.2	Hilly region- Architectural significances in planning,	2
	materials and construction techniques with respect to	
	occupation, culture, traditions, value systems, climate	
	and landform – Irula, Kurumba, Todas and Badagas	
2.3	Hinterlands- Architectural significances in planning,	2
	materials and construction techniques with respect to	
	occupation, culture, traditions, value systems, climate	
	and landform. Agrabarams at Taniore, Kumbakonam	
	and landform- Agranarams at Tanjore, Rumbakonam	
	Chettinad houses, Kuchi veedus etc	
3	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India	
3 3.1	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction	2
3 3.1	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and	2
3 3.1	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation,	2
3 3.1	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform	2
3 3.1 3.2	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural	2
3 3.1 3.2	Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction	2
3 3.1 3.2	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform 	2
3 3.1 3.2	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, techniques with respect to occupation, culture, traditions, value systems, climate and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform 	2
3 3.1 3.2 3.3	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, techniques with respect to occupation, culture, traditions, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements 	2 2 2 2
3 3.1 3.2 3.3	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value 	2 2 2 2
3 3.1 3.2 3.3	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform. 	2 2 2 2
3 3.1 3.2 3.3 4	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform. Vernacular Architecture of North India 	2 2 2 2
3 3.1 3.2 3.3 4 4.1	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform. Vernacular Architecture of North India Rajasthan- Traditional Havelies in Rajasthan- Climate, 	2 2 2 2 2 2 2
3 3.1 3.2 3.3 4 4.1	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform Vernacular Architecture of North India Rajasthan- Traditional Havelies in Rajasthan- Climate, Materials, Construction details, settlement planning of 	2 2 2 2 2 2
3 3.1 3.2 3.3 4 4.1	 Chettinad houses, Kuchi veedus etc Vernacular Architecture of South India Nallukettu and Ettukettu houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Boat Houses of Kerala- Introduction and Architectural significances, planning, materials and construction techniques with respect to occupation, culture, traditions, value systems, climate and landform Andhra Pradesh – Architecture of Maraikkal settlements with respect to occupation, culture, traditions, value systems, climate and landform. Vernacular Architecture of North India Rajasthan- Traditional Havelies in Rajasthan- Climate, Materials, Construction details, settlement planning of Jaipur. 	2 2 2 2 2 2

TOTAL	NUMBER OF PERIODS	26
	Kutch regions	
	construction details and architecture of Banni Houses in	
	Gujarat, their primitive form, climate, Materials and	

1. S. Radhakrishnan srkar

2. G. Asaithambi

- srkarch@tce.edu
- gaarch@tce.edu
- 3. R. ShanthiPriya <u>rsparch@tce.edu</u>

Sub Code	Lectures	Tutorials	Practical	Credits
ARA54	2	-	3	3

ARA54 STRUCTURES AND CONSTRUCTION

2:1

Preamble:

This course contributes to the students' knowledge of structural engineering, and provides RCC design skills. The student has already undertaken a basic study on the design and reinforcement detailing of RCC beams, columns and slabs in the previous semester. This subject provides a proper understanding of the design and detailing procedures of RCC Staircases, Foundations and Pre Stressed concrete elements.

Program Outcome addressed:

a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Knowledge about various RCC structural elements.
- 2. Comprehension about behaviour of RCC members in buildings.
- 3. Apply the structural knowledge gained in design.
- 4. Analyse various structural elements for stiffness and stability.
- 5. Evaluate and choose a suitable RCC structure for the given context.
- 6. Design RCC structural elements.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	20	20	20
4	Analyse	40	40	40
5	Evaluate	20	20	20
6	Create	0	0	0

Concept Map:



Syllabus:

Staircase: Types of staircases, Support conditions, Design of staircase – Design illustration for doglegged and open well staircases – *Drawings of doglegged and open well Staircases*. **Foundation**: Types of foundation – Wall and column footing – Area – safe bearing capacity – width and depth of foundation – Design of section of footing - Design of isolated square and rectangular footing – Design illustration – Design of combined rectangular footing - Retaining walls – types, their uses – Structural Principle and analysis of masonry retaining wall – Checking the stability - *Drawings of types of Foundation: Stepped, Isolated, Combined, Raft, etc.* **Pile Foundation**: Types of piles – Theory – Design illustration principles for pile foundation (no design calculation). *Drawings on Types of Pile Foundation.* **Prestressed Concrete:** Introduction to Pre-stressed Concrete, Concept and Principles of Pre-stressing, Materials, Types, methods of pre-stressing, pre-stressing systems, Layout of pre-stressed concrete beams, manufacturing of cast-in-situ and pre-cast members, Application, Analysis of Pre-stressing and losses.

Text books:

- N.Krishnaraju "Advanced Reinforced Concrete Design" CBS publishers & distributers, 1986
- 2. P.C.Varghese "Limit Statae Design" prentice hall of India private limited 2003.

Reference Books:

1. Ashok K.Jain, Reinforced Concrete Limit State Design. Namchand and Bros.,

Roorkee, 1983.

2. N.L.Shinha and S.K.Roy, Fundamentals of Reinforced Concrete, S.Chand and

Company, New Delhi, 1983.

Course content and lecture schedule:

S.No.	Торіс	No. of
		lectures
1	Staircase	
1.1	Types of staircases, Support conditions, Design of Staircase	2
1.2	Design illustration for doglegged and open well staircases	5
1.3	Drawings of doglegged, Spiral and Helical Staircases.	10
2	Foundation	
2.1	Types of foundation – Wall and column footing – area – safe bearing capacity – width and depth of foundation	2
2.2	Design of section of footing -Theory and design –	5
2.3	Design of isolated square and rectangular footing – Design illustration	10
2.4	Design of combined rectangular footing	3
2.5	Retaining walls – types, their uses - Structural Principle and analysis of masonry retaining wall – Checking the stability	4
2.6	Drawings of Types of Foundation : Stepped, Isolated, Combined, Raft, etc.	10
3	Pile Foundation	
3.1	Types of piles – Theory.	1
3.2	Design illustration principles for raft and pile foundation (no design calculation).	2

S.No.	Торіс	No. of
		lectures
3.3	Drawings on Types of Pile Foundation.	10
4	Pre-Stressed Concrete	
4.1	Introduction to Pre-stressed Concrete, Concept and Principles of Pre-stressing, Materials, types, methods of pre-stressing, pre-stressing systems.	2
4.2	Layout of pre-stressed concrete beams, manufacturing of cast-in-situ and pre-cast members, Application.	2
4.3	Analysis of Pre-stressing and losses.	2
	TOTAL	70

- 3. K. Arunachallam
- 4. K. Sudalaimani
- ksciv@tce.edu
- 5. Jinu Louishidha Kitchley
- 6. P. Kabilasri

jinujoshua@tce.edu kabilasri@tce.edu

karcivil@tce.edu

BOARD OF STUDIES MEETING ON 24.04.2010

Sub Code	Lectures	Tutorials	Practical	Credits
ARA55	3	-	2	4

ARA55 BUILDING SERVICES AND TECHNOLOGY II

3:1

Preamble:

Building services involves the design, installation, operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmental friendly operations. This course has been designed to understand the basic concepts and systems of various services required for building operations. In this course the services involve the study of Electrical systems and installation, Illumination and Lighting design, Fire Safety measures in buildings.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competencies:

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

 Understand about the basics of electrical systems and various electrical installations, principles of illumination, fire safety, detection and installations which are needed to co-ordinate the various services involved in building as designer.

- 2. Apply the knowledge in evolving electrical, lighting and fire fighting system layouts for buildings as to know the intricacies involved in planning & design services
- 3. Relate and comprehend the integration of various services like, electrical, lighting and fire fighting systems involved in buildings

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	40	40	40
4	Analyse	40	40	40
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Electrical Systems: Basics of electricity-Single/Three phase supply-Protective devices in electrical installations- Earthing for safety-Types of earthing - ISI specifications/NBC recommendations **Electrical Installation In Buildings:** Types of wires, wiring systems and their choice-Planning electrical wiring for building-Main and distribution boards transformers and switch gears - Location of

Substations. Electrical layout for a residential building – Load Calculations for a residence. Principles Of Illumination: Visual tasks- factors affecting visual tasks- Luminous flux-candela-Solid angle illumination- Utilisation factordepreciation factor- Laws of illumination - Modern theory of light and colour-Synthesis of light- Additive and subtractive synthesis of colour- Special features required and minimum level of illumination required for various activities -Lighting Design: Classification of lighting based on activities, light sources and fixtures - Spectral energy distribution - Luminous efficiency- colour temperaturecolour rendering, Lighting for residential, commercial and institutional spaces lighting for physically handicapped and elderly in building types. Lighting layout for different types of space. Fire safety - general provisions: Causes of firefire regulations - NBC – classification of buildings based on occupancy – Planning considerations in building involving Non-Combustible materials, construction, staircases and lift lobbies fire escapes and A.C. systems. Special features required for physically handicapped and elderly in building types. Fire detection and fighting installations: Heat and smoke detectors - Fire alarm system - Snorkel ladder – Automatic sprinkler systems – types and applications - Dry and Wet risers - water storage for fire-fighting system. Configuring, sizing and space requirements for fire-fighting equipments. Layouts showing fire-fighting systems. **Text Books:**

Text BOOKS.

- 1. Handbook for Building Engineering in Metric Systems, NBC, New Delhi, 1968.
- 2. Derek Philips, Lighting in Architectural Design, McGraw Hill, New York, 1964.

Reference Books:

- E.R.Ambrose, Heat Pumps and Electric Heating, John and Wiley and Sons.Inc., NewYork, 1968.
- R.G.Hopkinsoon and J.D.Kay, The Lighting of Buildings, Faber and Faber, London, 1969.
- 3. National Building Code, 2007

Course content and lecture schedule

S. No.	Торіс	No. of lectures
1	Electrical Systems:	
1.1	Basic of electricity-Single/Three phase supply-	2
1.2	Protective devices in electrical installations	2
1.3	Earthing for safety-Types of earthing -ISI specifications/NBC recommendations	1

S. No.	Торіс	No. of
		lectures
2	Electrical Installation In Buildings:	
2.1	Types of wires, wiring systems and their choice-	1
2.2	Planning electrical wiring for building-	1
2.3	Main and distribution boards transformers and switch	1
	gears-Layout of Substations.	
2.4	Electrical layout for a residential building	15
3	Principles of Illumination:	
3.1	Visual tasks-factors affecting visual tasks-	1
3.2	Luminous flux-candela-Solid angle illumination-	1
	illumination.	
3.3	Modern theory of light and colour-Synthesis of light-	2
	Additive and subtractive synthesis of color	
3.4	Special features required and minimum level of	1
	illumination required for various activities	
4	Lighting Design:	
4.1	Classification of lighting based on activities, light	1
	sources and fixtures -	
4.2	Spectral energy distribution-luminous efficiency- color	2
	temperature-color rendering,	
4.3	Lighting for residential, commercial and institutional	1
	spaces - lighting for physically handicapped and elderly	
	in building types.	
4.4	Lighting layout for Different types of Space – like	15
	residence, shop interiors, conference halls etc.	
5	Fire safety - general provisions:	
5.1	Causes of fire	2
5.2	Fire regulations - NBC – classification of buildings	1
	based on occupancy –	
5.3	Planning considerations in building like Non-	2
	Combustible materials, construction, staircases and lift	
	lobbies fire escapes and A.C. systems.	

S. No.	Торіс	No. of
		lectures
5.4	Special features required for physically handicapped	2
	and elderly in building types.	
6	Fire detection and fighting installations:	
6.1	Heat and smoke detectors - Fire alarm system -	2
	shorkel ladder –	
6.2	Automatic sprinkler systems - types applications - Dry	2
	and Wet risers	
6.3	Water storage for fire-fighting system.	2
6.4	Layouts showing fire-fighting equipments for a office/	10
	shopping/ apartments etc.	
	TOTAL	70

- 1. S.Karthikeya Raja skrarch@tce.edu
- 2. A.Madhumathi madhu@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA56	1	2	2	4

ARA56 WORKING DRAWING FOR BUILDINGS

3:1

Preamble:

This course is introduced to gain in-depth knowledge about the architectural drawings and details for the execution of the building. It familiarizes the student to read, interpret and produce architectural drawings in detail.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.

e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

Competencies:

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

- 1. Read all drawings required for construction.
- 2. Comprehend the conventions of building drawings.
- 3. Prepare complete set of drawings including approval drawings pertaining to the specifications.
- 4. Investigate various building construction details.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	80	80	80
4	Analyse	0	0	0
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

The structure of information in Working Drawings : Introduction to the need and relevance of Working Drawing Set, Comparison to Presentation

drawings - Information expected, various components and functions through set of drawings - The plan of work, various users of drawings - Structure of working drawing, primary, secondary structuring. Reading of working drawings: Reading of working drawing, their co-relation and cross-referencing in various technical projections like plans, elevations, sections, detailing etc. Working drawing set: Site plan, Floor plans, center line drawing, foundation plan, roof plan, external elevations, general sections, sectional elevations, interior detail drawings, reflected ceiling plan. Drawing conventions: Handing of sheets -Drawing sheet size - Templates - Title panels - Non-active lines, Grids, Dimensioning – Hatching - Electrical symbols - Annotation of drawing - Working drawing management: Planning the working drawing set – Drawing Status programming _ Drawing register, coding, Issuing drawings, Comprehending drawings of other consultants. Computer aided drafting: Block libraries, Reference edit, drawing overlay methods, Model exchange method. Exercise on preparing complete set of working drawings for а residential/institutional building including detailing for walls, roof and flooring, detailing of facades and details of carpentry, plumbing, electrical and finishes. -Integrating Building Information Modeling (BIM) software. Drawings for approval of local authorities: Introduction to need and relevance of approval drawings - Checklist as a guide for information in a approval drawing -Preparation of approval drawings of local authorities such as CMDA, Municipality etc, for a residential/institutional building. Detailing for Health & Safety: Safe footing; Fall protection; Safe Edges; Safe glazing; Barrier free design detailing.

Text books:

- 1. Keith Styles and Andrew Bichard, "Working Drawings Handbook", Architectural Press, 2004.
- Francis D.K .Ching, "Building Construction Illustrated", 3rd ed. John Wiley, New York 2003.

Reference Books:

- 1. W.Otie Kilmer, Rose Mary Kilmer, "Construction Drawings and Details for Interiors", John Wiley & Sons, Inc., 2003.
- Edward Allen, "Fundamentals of Building Construction: Materials and Methods", John Wiley & Sons, Inc., 1999.
- 3. Edward Allen, "Architectural Detailing: Function, Constructionability, Aesthetics", John Wiley & Sons, Inc., 1992.

Course content and lecture schedule:

S.No.	Торіс	No. of
		lectures
1	The structure of information	
1.1	Introduction to the need and relevance of Working Drawing Set, Comparison to presentation drawings - Information expected, various components and functions through set of drawings	1
1.2	The plan of work, various users of drawings – Structure of working drawing, primary, secondary structuring	1
2	Reading of working drawings:	
2.1	Reading of working drawing - Co-relation and cross- referencing in various technical projections like plans, elevations, sections, detailing etc.	1
3	Working drawing set:	
3.1	Site plan, Floor plans, Centerline drawing, foundation plan, roof plan	1
3.2	External elevations, general sections, sectional elevations, Interior detail drawings, reflected ceiling plan	1
3.3	Drawing conventions: Handing and opening - Drawing sheet size – Templates - Title panels - Non-active lines, Grids, Dimensioning – Hatching - Electrical symbols - Annotation of drawing	1
3.4	Working drawing management: Planning the working drawing set – Drawing programming, Drawing register, Status coding, Issuing drawings, Comprehending drawings of other consultants.	1
4	Computer aided drafting:	
4.1	Block libraries, Reference edit, drawing overlay methods, Model exchange method.	1
4.2	Exercise on preparing complete set of working drawings for a residential/institutional building	

S.No.	Торіс	No. of
		lectures
	including detailing for walls, roof and flooring, detailing	
	of facades and details of carpentry, plumbing,	
	electrical and finishes.	
4.2.1	Introduction to conventions in preparation of drawings	1
4.2.2	Understanding and preparing the details (Tutorial)	20
4.2.3	Initial Drafting	5
4.2.4	Final Drafting and lettering	10
4.3	Integrating a Building Information Modeling (BIM)	15
	software	
5	Drawings for approval of local authorities:	
5.1	Introduction to need and relevance of approval	1
	drawings – Checklist as a guide for information in a	
	approval drawing	
5.2	Exercises on preparation of approval drawings of local	
	authorities such as CMDA, Municipality etc, for a	
	residential/institutional building.	
5.2.1	Approval Drawing Layout – Initial Drafting (Tutorial)	5
5.2.2	Final Drafting, Lettering and Conventions	5
	TOTAL	70

1. Jinu Louishidha Kitchley

jinujoshua@tce.edu

2. P. Shabitha

psarch@tce.edu

3. P. Kabila Sri

kabilasri@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits

ARA57 - 14 7 ARA57 ARCHITECTURAL DESIGN IV 0:7

Preamble:

The process of Architectural Design involves the proper understanding and effective application of services in the design of buildings. This architectural design studio undertakes comprehension of spaces in multiple level planning and incorporation of services such as electrical, plumbing and lighting.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Design the built environment involving the complexities of multi use and multi level space planning.
- 2. Comprehension of issues involving the integration of services in multilevel planning viz, water supply, electrical, lighting services and fire safety.

Syllabus:

Exercises involving Multi use space and multi level planning – Activity analysis, space analysis, circulation pattern, furniture layout, service layout etc - such as Apartments, Commercial Centres, Hospitals, Auditorium etc.

Reference Books:

- De Chiara and Callender, Time saver standards for Building Types, Mc Graw Hill Co., New York, 1973.
- 2. Nufert Ernst, Architects Data, Blackwell Science Ltd., Britain, 1980.
- 3. Sir Christopher Alexander, A Pattern Language: Towns, Buildings, Construction, Oxford University Press, 1977.
- 4. Sir Christopher Alexander, The Timeless way of building, Oxford University Press, 1979.
- 5. Julius Panero, Martin Zelick, Human Dimension and Interior Space, Whitney Library of Design, Canada- 1979.

Course Designers:

- 1. V. Balasubramanian vbsarch@tce.edu
- 2. R. Shanthi Priya rsparch@tce.edu
- 3. Jinu Loushidha Kitchley jinujoshua@tce.edu

ARA61 Human Settlement Planning

3:0

Preamble:

Planning is a process to achieve the goals and objectives of development through the rational and efficient use of available resources. Human settlement planning must seek to improve the quality of the life of people with full respect to indigenous, cultural and social needs. This course is intended to create awareness of the physical aspects of a settlement and the forces that shape it.

Program Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Acquire knowledge in planning surveys and strategies.
- 2. Analyse, generate alternative planning strategies and evaluation of options and preparation of plans.
- 3. Understanding of planning concepts and philosophies of various Architects.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	0	0	0

Concept Map:



Syllabus:
Elements of human settlements: Vancouver Declaration on Human Settlements, Rural and urban settlements - evolution of settlements - ancient, medieval and modern. Planning as an interdisciplinary process, Basic components/ factors influencing urban settlements and their interrelationships, Types of settlements based on configuration of shape, Ecological process and models of land use structure of urban settlements. Planning for Human Settlements: Need, General issues, problems and potentials of human settlements - Objective of planning - Planning process and monitoring -Strategies and guidelines for planning - UN Millennium Development Goals -UDPFI guidelines. Case study of local city/ town. Planning concepts and philosophies: Planning concepts and philosophies of Doxiadis, Patric Geddes, Ebenezer Howard, CA Perry, Lewis Mumford, Le Corbusier, F.L. Wright- Planning concepts at settlement level -International and Indian case studies. Planning system in India :Planning machinery in India – hierarchy – levels of planning – Town and country planning act -types of plans - Regional plan, Master plan, Structure *plan*, Detailed Development plan - their scope and content and planning process – Various Urban Development programmes – IDSMT, IUDP, Sustainable cities program, JNNURM. Rural Planning : Rural Settlement structure - Micro level planning – Salient features of the 73rd & 74th amendment to the Indian Constitution and its impact on planning - Rural development programmes - Salient features of PURA.

Text Books:

- 1. Dr.H.D.Kopardekar, 'Urban and Regional planning: Principles practice and the Law', Sudhanwa.H.Kopardekar. Talegaon-Dabhade, 1994.
- 2. Rangwala, 'Town Planning', Charotar publishing house, 2003.
- G.K.Hiraskar, 'Fundementals of Town Planning', DhanpatRai publications, 2005.
- 4. John Ratcliffe, An Introduction to Town and Country Planning: 2000.

Reference Books:

- 1. C.L.Doxiadis, Ekistics, 'An Introduction to the Science of Human Settlements', Hutchinson, London, 1968.
- Government of India, 'Report of the National Commission on Urbanisation', 1988.
- Ministry of Urban Affairs and Employment, Government of India, New Delhi, 'Urban Development Plans: Formulation & Implementation' Guidelines 1996.
- Hansen N., 'Regional Policy and Regional Integration' Edward Elgar, UK, 1996.

5. Andro D.Thomas, 'Housing and Urban Renewal, George Allen and Unwin, Sydney, 1986.

Course cont	tent and	lecture	schedule:
-------------	----------	---------	-----------

S. No.	Торіс	No. of
		lectures
1	Elements of human settlements	
1.1	Rural and urban settlements	1
1.2	Evolution of settlements – ancient, medieval and modern	2
1.3	Planning as an interdisciplinary process	1
1.4	Vancouver Declaration on Human Settlements	1
1.5	UN Millennium Development Goals	1
1.6	Basic components/ factors influencing urban settlements and their interrelationships	1
1.7	Types of settlements based on configuration of shape, Ecological process	2
1.8	Models of land use structure of urban settlements.	2
2	Planning for Human Settlements	
2.1	General issues, problems and potentials of human settlements	1
2.2	Objective of planning, Planning process and monitoring	2
2.3	Strategies and guidelines for planning – UDPFI guidelines.	2
2.4	Case study of local city/ town	2
3	Planning concepts and philosophies	
3.1	Planning concepts and philosophies of Doxiadis	1
3.2	Planning concepts and philosophies of Patric Geddes	1
3.3	Planning concepts and philosophies of Ebenezer Howard, CA Perry	2
3.4	Planning concepts and philosophies of Lewis Mumford, Le Corbusier	2

S. No.	Торіс	No. of
		lectures
3.5	F.L.Wright- planning concepts at settlement level	1
3.6	International and Indian case studies	2
4	Planning system in India	
4.1	Planning machinery in India – hierarchy – levels of planning, Town and country planning Act	2
4.2	Types of plans - regional plan, Master plan, structure plan.	2
4.3	Zonal Development plan- their scope and content and planning process	1
4.4	Various Urban Development programmes – IDSMT, IUDP	2
4.5	Sustainable cities program, JNNURM, ITUC	2
5	Rural Planning	
5.1	Rural Settlement structure	1
5.2	Micro level planning	1
5.3	Salient features of the 73 rd & 74 th amendment to the Indian constitution	1
5.4	Rural development programmes	1
	Total Periods	40

Course Designers:

1.	V.	Balasubramanian		vbsarch@tce.edu
----	----	-----------------	--	-----------------

2. R. Shanthipriya rsparch@tce.edu

3. P. Shabitha <u>psarch@tce.edu</u>

Sub Code	Lectures	Tutorials	Practical	Credits
ARA6E	3	-	-	3

ARA6E Sustainable Architecture

3:0

Preamble:

The course explores, investigates and analyzes the concepts associated with the issue of "sustainability" and it's relation to Architecture and Urbanization. It deals with the ideas, issues and concepts of sustainable Architecture, global environment and the built environment, principles of environment and ecology.

Program Outcome addressed:

- b. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. To expand creative methods of architectural synthesis by the integration of bioclimatic and ecologic criteria
- 2. To demonstrate the design opportunity of ecological responsibility within the built environment.
- 3. To create memorable architecture with measurable performance.

Assessment Pattern:

	Blooms	Test 1	Test 2	Test 3 / End
	Category			semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30

B.ARCH - FIRST AND SECOND SEMESTERS 2010-11

4	Analyze	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Concepts of sustainability: Energy and Global environment – Impact of Energy use on Climate change –Types of Energy systems Concept of Sustainability - Principles of energy conservation - Synergy with nature- Bioregionalism - community basis shelter technology within bioregional patterns. **Sustainable Planning & Design:** Sustainable Development -Sustainable approach to site planning and Design site inventories- Relationships between the various site factors - Impacts of development in eco sensitive areas - Model ecosystem of the site - Environmental monitoring and testing during stages of development - Limits of change - Design facility within social and environmental thresholds. **Sustainable Building Materials and Construction:** Properties, Uses and Examples of -Primary, Secondary and Tertiary Sustainable Materials - Techniques of sustainable construction - Technologies, methods of effectiveness, and design synthesis – alternative materials and construction methods: solar water heating panels; photovoltaic electricity generation; use of local materials; and on site

growth of food, fuel and building materials. **Recycling and Reuse** Conservation of natural and building resources- Architectural Reuse, Waste prevention, Construction and Demolition, Recycling in Pre building, Building, Post Building stages - Energy and material savings types of wastes - Elimination of waste and minimize pollution- various Decomposing methods – Innovative reuse of various wastes. **Case Studies and Rating systems** Sustainable Development Case Studies: illustrated examples of the planning, development, and construction. Green Architecture and various international rating systems for sustainability LEED, BREEAM, Green Star Rating System.

Text Books:

- 1. B.C.Bose, "Integrated approach to sustainable Development". Publishers: Rajat Publications, Delhi, 2001.
- 2. Laurie Baker's, "Chamoli Earthquake hand book", Publishers: Costford, centre of science and technology for rural development. 2000
- Fuller Moore, "Environmental control systems Heating, Cooling, Lighting". Publisher MC.Graw Hill, Newyork.1992
- 4. Sustainable Building Design Manual- Volume I, TERI. 2005
- 5. Sustainable Building Design Manual- Volume II, TERI.2005
- 6. Energy Efficient Buildings in India, TERI.2005

References:

 Caring A.Langston Grace K.C.Ding, "Sustainable practices in built environment", second edition, Publishers: Butterworth-Heinmann Linacre House Jordanhill Oxford.2009.

2. R.N.Trivedi, Environmental Sciences, Publishers: Anmol Publications Pvt Ltd, New

Delhi.2002

3. Dr.N.Arumugam, Concepts of Ecology (Environmental biology), Saras Publication, Kanyakumari District.1994

Course content and lecture schedule:

S. No.	Торіс	No of
		Lectures
1.	Concepts of sustainability:	
1.1	Energy and Global environment – Impact of Energy use on	2
	Climate change	
1.2	Types of Energy systems Concept of Sustainability -	2
	Principles of energy conservation	
1.3	Synergy with nature- Bioregionalism - community basis	3
	shelter technology within bioregional patterns.	

2.0	Sustainable planning & Design:	
2.1	Sustainable Development -Sustainable approach to site	2
	planning and Design site inventories	
2.2	Relationships between the various site factors - Impacts of	3
	development in eco sensitive areas	
2.3	Model ecosystem of the site - Environmental monitoring and	3
	testing during stages of development	
2.4	Limits of change - Design facility within social and	3
	environmental thresholds.	
3.0	Sustainable building materials and Construction:	
3.1	Properties, Uses and Examples of -Primary, Secondary and	2
	Tertiary Sustainable Materials	
3.2	Techniques of sustainable construction - Technologies,	3
	methods of effectiveness, and design synthesis	
3.3	alternative materials and construction methods, solar water	3
	heating panels; photovoltaic electricity generation	
3.4	use of local materials; and on site growth of food, fuel and	2
	building materials	
4.0	Recycling and Reuse	
4.1	Conservation of natural and building resources- Architectural	2
	Reuse, Waste prevention, Construction and Demolition,	
	Recycling in Pre building, Building, Post Building stages	
4.2	Energy and material savings types of wastes	2
4.3	Elimination of waste and minimize pollution- various	2
	Decomposing methods – Innovative reuse of various wastes.	
5.0	Case Studies and Rating systems	
5.1	Sustainable Development Case Studies: illustrated examples	3
	of the planning, development, and construction.	
5.2	Green Architecture and various international rating systems	3
	for sustainability LEED, BREEAM, Green Star Rating System.	
	TOTAL	40

Course Designers:

5. A. Madhumathi

madhu@tce.edu

6. I. Chandramathy

icarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA6F	3	-	-	3

ARA6F DESIGN PRINCIPLES FOR DISASTER MANAGEMENT 3:0

Preamble:

Disaster Prevention, Mitigation, Preparedness and Ensuring safe construction of new buildings and retrofitting of selected buildings are to be taken care by architects and building professionals. Land Use Planning and Safe Construction Practices is essential to ensure the strength of knowledge dissipation on natural disaster mitigation for budding architects.

Programme Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course, the student will able to

- 1. Understand the Building Norms, Standards, Bye laws as per NBC, National Earthquake Guidelines and BIS.
- 2. Competent to handle Projects individually towards Building safety from natural hazards.
- 3. Comprehend the various issues related to the design of Seismic Resistant buildings.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	60	60	60
4	Analyse	0	0	0
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Building safety from natural hazards: an introduction: Disaster - definition, types – geology, mass movement and land disasters – earthquake, landslides, volcano, fire safety in buildings- hydrological, coastal and marine disasters-flood, cyclone effects, tsunami, high winds and storm surge. Elementary seismology and site development: Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India and the states. Causes of earthquake, seismic waves: magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions, site selection, site development, building forms - horizontal & vertical eccentricities, mass and stiffness distribution, soft storey etc., Plan & vertical irregularities, redundancy and setbacks. Seismic design principles: Special aspects - torsion, appendages, staircases, adjacency & pounding, earthquake resistant construction details foundations, flooring, walls, openings, roofs, terraces, parapets, boundary walls, overhead tanks, staircases and isolation of structures - contemporary

international approaches – concepts in repair, restoration & seismic strengthening, materials & equipment for restoration of masonry & concrete structures. **Hydrological, coastal and marine disasters:** Types of floods – Indian subcontinent scenario, Integrated flood management information systems(IPMIS), Tropical cyclones, Impacts of Cyclonic Storms Along East Coat of India, Coastal Floods, Physiological Hazards – Cyclone Protection and post Cyclone Rehabilitation Measures – BIS standards – Cyclone Resistance structures, cyclonic resistance of low rise houses and other buildings/structures. **Landslides:** Preparation of landslide – Hazard zonation maps – Landslide Analysis, Site Evaluation for human settlement and safe design, selection of building materials & mode of construction suitable for hilly Area, Guidelines for Landslide control-guidelines for siting, design and selection of building materials for residential structures – Selection of type of walls – Guidelines for retaining wall for hill areas, construction of dry stone walls.

Text Books:

- 1. Repair and Strengthening of Earthquake Damaged Low rise Domestic Buildings In Gujarat, India, Great Publications, New Delhi, June 2001,
- 2. *Dr.I.Sundar, Mr. T.Sezhiyan*, Disaster management, published by Sarup & sons, New Delhi, 1st edition -2007

References:

- 1. Harish K Gupta, Disaster Management, Published by, universities Press (India) Private Limited, Hyderabad, 2003.
- 2. Raju N. Krishna, Reinforced Concrete Design: Principles and Practice, New age international publishers, New Delhi, 2003
- 3. Joseph Aicher, Design Principles of Natural Disaster, Krieger pub. co., 1998

S.No	Торіс	Νο	of
		Lectures	
1.0	Building safety from natural hazards: an introduct	ion	
1.1	Disaster – definition, types	1	
1.2	Geology, mass movement and land disasters	2	
1.3	Earthquake, landslides, volcano, fire safety in buildings	3	
1.4	Hydrological, coastal and marine disasters-flood, cyclone effects, tsunami, high winds and storm surge.	3	
2.0	Elementary seismology and site development		

Course content and lecture schedule

S.No	Торіс	No	of
		Lectures	
2.1	Earthquake occurrence in the world, plate tectonics,	1	
	faults, earthquake hazard maps of India and the		
	states.		
2.2	Causes of earthquake, seismic waves: magnitude,	2	
	intensity, epicentre and energy release		
2.3	Characteristics of strong earthquake ground motions,	3	
	site selection, site development, building forms:-		
	horizontal & vertical eccentricities, mass and stiffness		
	distribution, soft storey etc.,		
3.0	Seismic design principles	I	
3.1	Special aspects – torsion, appendages, staircases,	2	
	adjacency & pounding.		
3.2	Earthquake resistant construction details -	2	
	foundations, flooring, walls, openings, roofs, terraces,		
	parapets, boundary walls, overhead tanks, staircases		
	and isolation of structures		
3.3	Contemporary international approaches - concepts in	9	
	repair, restoration & seismic strengthening, materials		
	& equipment for restoration of masonry & concrete		
	structures.		
4.0	Hydrological, coastal and marine disasters		
4.1	Types of floods – Indian sub-continent scenario,	1	
	Integrated flood management information		
	systems(IPMIS)		
4.2	Tropical cyclones, Impacts of Cyclonic Storms Along	1	
	East Coat of India, Coastal Floods, Physiological		
	Hazards		
4.3	Cyclone Protection and post Cyclone Rehabilitation	2	
	Measures – BIS standards		
4.4	Cyclone Resistance structures, cyclonic resistance of	2	
	low rise houses and other buildings/structures.		
5.0	Landslides	1	
5.1	Preparation of landslide – Hazard zonation maps ––	1	
5.2	Landslide Analysis, Site Evaluation for human	1	

S.No	Торіс	No	of
		Lectures	
	settlement and safe design.		
5.3	Selection of building materials & mode of construction suitable for hilly Area.	1	
5.4	Guidelines for Landslide control- guidelines for siting, design and selection of building materials for residential structures	1	
5.5	Selection of type of walls – Guidelines for retaining wall for hill areas, construction of dry stone walls.	2	
	Total Periods	40	

Course Designers:

- 1. S. Radhakrishnan srkarch@tce.edu
- 2. S.Subhashini ssarch@tce.edu

Sub. Code	Lectures	Tutorials	Practical	Credits
ARA6G	3	-	-	3

ARA6G Environmental Behaviour Studies

3:0

Preamble:

Environmental behaviour, in the context of architectural design, includes systematic examination of relationships between the built environment and human behaviour and its application in the design process. An understanding of environment and human behaviour will help the students to enhance their design skill encompassing functional and visual aspects.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.

g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. To understand the biological, personal, social and cultural context of the users on built environment.
- 2. Understanding of the multiplicity of living patterns, activities, geometric patterns in space and designing for the same.
- 3. Knowledge of the behavioural design process, techniques and design contexts to enhance the quality of spaces designed.

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	0	0	0

Assessment Pattern:

Concept Map:



Syllabus:

Introduction to Environmental Behavioural Studies: Relationship between Human Behaviour and Built environment, Behaviour within environment, Factors affecting environmental perspective, Influence of Environment upon behaviour. Understanding Space: Spatial Experience, Perception, Interpretation, Environmental Cognition, Physical and social factors such as settings, time, climatic condition, crowding etc. Types of Environment- user groups and design, building types and design, Architectural elements and its relation to behaviour, Territoriality- Nature of territoriality, function of territoriality, territorial organization, fundamental understanding of micro space, meso space and macro space. Micro space: Defining personal space, classifying personal space, variability of personal space, proxemics, spatial integration, segregation, invasion. Meso space and macro space: Cognitive patterns, the neighborhood unit philosophy of neighborhood, typology, perception of neighborhoods, criticism of neighborhood ideology, neighborhood satisfaction, the urban environment, the image of the city. Application of Behavioral studies in architecture: Understanding the application and influence of behavioral studies in architectural design process – case examples – relevant architectural projects such as healing environment, therapeutic environment, learning environment – defensible concepts in housing.

Text book:

- 1. Sir Christopher Alexander, A Pattern Language: Towns, Buildings, Construction, Oxford University Press, 1977.
- Oscar Newman, Defensible spaces, HUD's Office of Policy Development and Research, 1970
- 3. Kevin Lynch, The image of a city, Cambridge MIT, 1973.

References:

- 1. Thomas F Saarinen, Environmental planning Perception and Behavior, Houghton Mifflin Company Boston, 1976
- J Douglas Porteoin, Environment and behavior Planning & Everyday Urban life, Addison Wesley Publishing, 1977
- 3. Clovis Heimsath, Behavioral architecture, Mc Graw hill, 1977
- 4. David canter & Terence lee, Psychology and the built environment, Halstead press, New York, 1974.

Course content and lecture schedule:

S. No	Торіс	No of
		Lectures

S. No	Торіс	No of
		Lectures
1.0	Introduction to Environmental Behavioural	
	Studies:	
1.1	Relationship between Human Behaviour and Built	3
	environment, Behaviour within environment	
1.2	Factors affecting environmental perspective, Influence	3
	of Environment upon Behaviour	
2.0	Understanding Space:	
2.1	Spatial Experience, Perception, Interpretation,	2
	Environmental Cognition,	
2.2	Physical and social factors such as settings, time,	3
	climatic condition, crowding etc	
2.3	Types of Environment- user groups and design,	3
	building types and design	
2.4	Architectural elements and its relation to Behaviour	
2.5	Territoriality- Nature of territoriality, function of	2
	territoriality, territorial organization	
2.6	Fundamental understanding of micro space, meso	2
	space and macro space	
3.0	Micro space:	
3.1	Defining personal space, classifying personal space,	3
	variability of personal space, proxemics	
3.2	Spatial integration, segregation, invasion.	3
4.0	Meso space and macro space:	
4.1	Cognitive patterns, the neighborhood unit - philosophy	3
	of neighborhood, typology	
4.2	Perception of neighbourhoods, criticism of	2
	neighbourhood ideology, neighbourhood satisfaction	
4.3	The urban environment	3
4.4	The image of the city.	2
5.0	Application of Behavioral studies in architecture:	

S. No	Торіс	No of
		Lectures
5.1	Understanding the application and influence of	3
	behavioral studies in architectural design process	
5.2	Case examples – relevant architectural projects such	3
	as healing environment, therapeutic environment,	
	learning environment – defensible concepts in housing.	
	Total	40

Course Designers: 1. P.Shabitha

- <u>psarch@tce.edu</u>

2. P. Kabila Sri - kabilasri@tce.edu

	Lectures	lutorials	Practical	Credits
GEARA6H	2	-	-	2

GEARA6H STRUCTURE AND ARCHITECTURE

Preamble:

An Architecture student needs to understand the integration of contemporary structural concepts in Building design to realize the creative forms they envisage in the design process. This course will familiarize the student in modern concepts of structural design and support the student to decide on the choice of structural framework suitable for his design context.

Program Outcome addressed:

- f. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- f. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

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

- Understanding the evolution of structural process through history.
- Comprehend about various modern concepts involved in structural design.
- Analyse architectural ease studies which excel in structural innovations.
- To evaluate the understanding of the relationship between form & structure.

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	-	-	-
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	-	-	-

Assessment Pattern:



Syllabus:

HISTORY OF STRUCTURAL DESIGN IN THE PRE INDUSTRIAL ERA -Development of monolithic and rock cut structures- Trabeated constructionarcuate construction vaults

and flying buttresses- tents and masted structures and bridges through ancient and

medieval history. **HISTORY OF STRUCTURAL DESIGN IN THE POST INDUSTRIAL PERIOD** -Post Industrial modular construction of large span and suspension structures in steel andconcrete- projects of Pier Nuigi Nervi, Maillart, Candella, Buckminster Fuller and EeroSaarinen. **CONTEMPORARY STRUCTURAL EXPRESSION THROUGH CASE STUDY** – study of architectural form and structural expression, Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Norman Foster - KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Distribution Centre, Swindon, UK ; Works of Fosters/Arup - Standsted Airport Terminal, London, UK; Works of Nicholas Grimshaw - British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal, London, UK; Works of Richard Rogers - Inmos Microchip Factory, Newport, UK , Centre Commercial St. Herbtain,France, PA Technology, Princeton and Fleetguard, Quimper, UK; Works of Santiago Calatrava - Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich; Works of Renzo Piano - Kansai International Airport, Japan, UNESCO Workshop, Italy, the Jean-Marie Tjibaou Cultural Center, New Caledonia Menil - Museum, Texas, Thomson Optronics Factory, France, IBM Traveling Exhibition Pavilion, Columbus International Exposition, Genoa, Italy and Lowara Office building, Italy , Works of Frank Gehry - Guggenheim Museum, Bilbao, Walt Disney Concert Hall, Los Angeles, BP Pedestrian Bridge , Chicago; Works of Zaha Hadid - – Vitra Fire Station, Germany, Bridge Pavilion in Zaragoza, Aragon, Spain, Riverside Museum, Scotland, Guangzhou Opera House, China

Text Books

1. Francis D.K. Ching, Building Structures Illustrated- Patterns, Systems and Design, John Wiley & Sons, 2009.

Reference Books

1. Joseph De Chiara & John Handcoach Calender, "Time Saver stds, For Bldg. Types", MCGraw – Hill Book Company, New York, 1980.

S. No.	Торіс	No. of
		lectures
1	HISTORY OF STRUCTURAL DESIGN IN THE PRE	
	INDUSTRIAL ERA	
1.1	Development of monolithic and rock cut structures	1
1.2	Trabeated construction-arcuate construction vaults and	1
	flying buttresses	
1.3	Tents and masted structures and bridges through ancient	1
	and	
	medieval history	
2	HISTORY OF STRUCTURAL DESIGN IN THE POST	
	INDUSTRIAL PERIOD	
2.1	Post Industrial modular construction of large span and	1
	suspension structures in steel and concrete	
2.2	Projects of Pier Nuigi Nervi, Maillart, Candella	2
2.3	Projects of Buckminster Fuller and Eero Saarinen	1
3	CONTEMPORARY STRUCTURAL EXPRESSION	

Course content and lecture schedule:

S. No.	Торіс	No. of
		lectures
	THROUGH CASE STUDY	
3.1	Study of architectural form and structural expression,	1
3.2	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Norman Foster - KCR Terminal at Hung Hom, Hong Kong, B3 Offices in Stockley Park , Sainsbury Centre for Visual Art, Renault Distribution Centre, Swindon UK , Works of Fosters/Arup - Standsted Airport Terminal, London, UK	3
3.3	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Nicholas Grimshaw - British Pavilion EXPO 1992, Seville, Spain and Waterloo International Terminal, London, UK	3
3.4	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Richard Rogers - Inmos Microchip Factory, Newport, UK, Centre Commercial, St. Herbtain, France, PA Technology, Princeton and Fleetguard, Quimper, UK	3
3.5	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Santiago Calatrava - Athens Olympic Stadium and Village, Bridges and Public Bus Stop in St. Gallen , Railway Station, Lyon, France and Stadelhofen Railway station, Zurich	3
3.6	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Renzo Piano - Kansai International Airport, Japan, UNESCO Workshop, Italy, the Jean-Marie Tjibaou Cultural Center, New Caledonia, Menil - Museum, Texas, Thomson Optronics Factory, France, IBM Traveling Exhibition Pavilion, Columbus International Exposition,	3

S. No.	Торіс	No.	of
		lectures	5
	Genoa, Italy and Lowara Office Building, Italy		
3.7	Study of structural philosophy and analysis, building envelope and services and construction sequence through Case studies: Works of Frank Gehry - Guggenheim Museum, Bilbao, Walt Disney Concert Hall, Los Angeles, BP Pedestrian Bridge , Chicago; Works of Zaha Hadid – Vitra Fire Station, Germany, Bridge Pavilion in Zaragoza, Aragon, Spain, Riverside Museum, Scotland, Guangzhou Opera House, China	3	
	TOTAL	26	

Course compilers:

- 1. Jinu Louishidha Kitchley jinujoshua@tce.edu
- 2. P.Shabitha
- psarch@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
GEARA6I	2	-	-	2

GEARA6I CONSTRUCTION TECHNOLOGY

2:0

Preamble:

Architects are the master craftsmen. It is essential that they have thorough and complete knowledge of the construction practices and technology as they will be supervising the construction process in terms of quality, time management, certification of bills and checking malpractices with total control. Also this knowledge will help them in advising the client in choosing the right materials, finishes and modes of construction, bringing the client maximum benefit in terms of quality and cost.

Programme Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competency:

At the end of the course, the student will able to

- 1. Understand the process of construction and the technology involved.
- 2. Understand about various finishes for buildings.
- 3. Knowledge about new materials and equipments for construction

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

General Building Requirements: Classification of buildings - Sites and Services - Requirements of parts of buildings. Construction Systems: Planning - Cast in situ construction (ready mixed pumped etc.) Reinforced concrete and prestressed concrete constructions precast concrete and pre- fabrication system - Modular Coordination - Structural schemes. Construction Practice: Manufacture, storage, transportation and erection of precast component forms, moulds and Scaffoldings in construction - safety in erection and dismantling of constructions. **Construction Equipment:** Uses of the following: Tractors, bulldozers, shovels draggling, cableways and belt conveyors, batching plants - Transit mixers and agitator trucks used for ready mix concrete pumps Guniting equipments - Air compressors - welding equipment - cranes and other lifting devices Choice of construction equipment for different types of works. Construction Management: Overview of construction management including estimating, cost control, quality control, safety, productivity, value engineering, claims, and legal issues planning and scheduling Modern Materials of Construction: Fiber reinforced polymer and light weight concrete. Ferro cement - High strength steel - Pre stressing tenders - Light gauge sections - Plastics - Fibre glasses - Materials storage practices

Text Books:

 R. Chudley, Construction Technology, Longman Group Limited, England, 1985
R. Barry, The Construction of Buildings, The English Language Book Society and

Crosby Lockwood, Staples, London, 1976

References:

- 1. National Building Code of India, 2005
- Frank R. Dagostino, Materials of Construction Details given Reston Publishing Company, nc.Virginia, 1976.
- 3. M. Mohsin, Project Planning and Control, Vikas Publishers, New Delhi, 1983

S.No	Торіс	No	of
		Lectures	
1	General Building Requirements		
1.1	Classification of buildings, Sites and Services	1	
1.2	Requirements of parts of buildings.	2	
2	Construction Systems		

Course content and lecture schedule:

S.No	Торіс	No of
		Lectures
2.1	Planning in Construction System	1
2.2	Cast in situ construction (ready mixed pumped etc.)	1
2.3	Reinforced concrete and prestressed concrete	2
	constructions precast concrete and pre- fabrication	
	system	
2.4	Modular Coordination – Structural schemes	1
3	Construction Practice	
3.1	Manufacture, storage, transportation and erection of	2
	precast component forms, moulds and Scaffoldings in	
	construction	
3.2	Safety in erection and dismantling of constructions	1
4	Construction Equipment	
4.1	Uses of Tractors, bulldozers, shovels draggling,	2
	cableways and belt conveyors, batching plants	
4.2	Transit mixers and agitator trucks used for ready mix	2
	concrete pumps Guiniting equipments.	
4.3	Air compressors - welding equipment - cranes and	2
	other lifting devices Choice of construction equipment	
	for different types of works	
5	Construction Management	
5.1	Overview of construction management	1
5.2	Estimating, cost control, quality control.	2
5.3	safety, productivity, value engineering, claims, and	2
	legal issues	
6	Modern Materials of Construction:	
6.1	Fiber reinforced polymer and light weight concrete.	1
	Ferro cement concrete	
6.2	High strength steel, Light gauge sections	1
6.3	Plastics, Fiber glasses	1
6.4	Materials storage practices	1

S.No	Торіс	No of	
		Lectures	
	Total Periods	26	

Course Designers:

- 1. P.Ananthalakshmi <u>anantha@tce.edu</u>
- 2. S.Subhashini <u>ssarch@tce.edu</u>

B.ARCH - FIRST AND SECOND SEMESTERS 2010-11

Sub Code	Lectures	Tutorials	Practical	Credits
GEARA6J	2	-	-	2

GEARA6J VALUE EDUCATION Preamble:

The primary objective of education is to inculcate certain values and principles in the student for a harmonious and progressive development. Hence this course helps the student evolve into a person with a holistic vision and growth that caters to an individual's intellectual, personal, emotional, social, spiritual and professional development.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competency:

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

- To develop students as good, responsible and constructive citizens who play a significant role in the future.
- Providing in students social, moral and spiritual virtues
- To enable students to acquire knowledge and experience to develop their capacities to judge and choose appropriate values.
- To develop in students respect for personal, social, professional and behavioural values.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	-	-	-
4	Analyse	60	60	60
5	Evaluate	-	-	-
6	Create	-	-	-

Concept Map:



Syllabus:

VALUE EDUCATION- Introduction, Definition of values, Need for Inculcation of values, Object of Value Education, Sources of Values, Types of Values: Personal values, Social values, Professional values, Moral and spiritual values, Behavioural (common) values. PERSONAL VALUES - Definition of person, Self confidence, Self discipline, Self Assessment, Self restraint, Self motivation – Determination, Ambition, Contentment, Humility and Simplicity - Sympathy and Compassion, Gratitude, Forgiveness, Honesty - Courtesy. SOCIAL VALUES - Definition of Society, Units of Society, Individual, family, different groups, Community, Social Equality and Brotherhood, Dialogue, consciousness, Tolerance, Sharing, and Responsibility, Co-operation Freedom, Repentance Magnanimity. **PROFESSIONAL VALUES** – Definition, Competence, Confidence, Devotion to duty, Efficiency, Accountability, Respect for learning /learned, Willingness to learn-Open and balanced mind, Team spirit, Professional Ethic, Willingness for Discussion, Aims, Effort, Avoidance of Procrastination and slothfulness, Alertness. BEHAVIORAL VALUES - Individual values and group values, Good manners at home and outside, Equality, Purity of thought, speech and action, Understanding the role of religion, Faith, Understanding the commonness of religions, respect for other faiths, unity in diversity, Living together, Tolerance, Non-violence, Truthfulness, Common aim, Unified effort towards peace, Patriotism.

Text Books

- 1. Robin Sharma, The Greatness Guide, Jaico Publishing House, 2009
- Dr. S. Ignacimuthu S. J., Values for life, Better yourself Books, Mumbai, 1999
- 3. R. P. Shukla, Value Education and Human Rights, Sarup & Sons, 2004
- David N. Aspin, Judith D. Chapman, Values Education and Lifelong Learning: Principles, Policies, Programmes, Springer, 2007
- Dr.Promila Kapur, Value Education: Based On All The Religions Of The World, Gyan Publishing House, 2008
- J.Krishnamurthy, A Flame of Learning, Krishnamurthy with teachers, Krishnamurthy Trust Ltd., England, 2005
- 7. J.Krishnamurthy, What are you doing with your life, Krishnamurthy foundation of America, California, 2001
- Life and thoughts of Mahatma Gandhi, compiled by Krishna Kripalani, Navajivan publishing house, Ahmedabad, 2008
- 9. M. K. Gandhi, Towards New Education, Navajivan Mudranalaya, Ahemadabad, 1953
- 10. M.K.Gandhi, My Experiments with Truth, Jaico Publishers, Ahemadabad, 1993.
- All men are brothers Life And Thoughts Of Mahatma Gandhi As Told In His Own Words, Compiled by Krishna Kripalani, Navajivan Mudranalaya, Ahemadabad, 1960

S. No.	Торіс	No. of
		lectures
1	VALUE EDUCATION	
1.1	Introduction, Definition of values, Need for Inculcation of values,	2
1.2	Object of Value Education, Sources of Values,	1
1.3	Types of Values : Personal values, Social values, Professional values, Moral and spiritual values, Behavioral (common) values	1
2	PERSONAL VALUES	
2.1	Definition of person, Self confidence, Self discipline, Self Assessment, Self restraint	2
2.2	Self motivation – Determination, Ambition, Contentment	1

S. No.	Торіс	No. of
		lectures
2.3	Humility and Simplicity - Sympathy and Compassion,	1
	Gratitude, Forgiveness, Honesty – Courtesy	
3	SOCIAL VALUES	
3.1	Definition of Society, Units of Society, Individual, family,	2
	different groups, Community	
3.2	Social consciousness, Equality and Brotherhood, Dialogue,	2
	Tolerance	
3.3	Sharing, Responsibility, Co-operation Freedom,	1
	Repentance and Magnanimity	
4	PROFESSIONAL VALUES	
4.1	Definition, Competence, Confidence, Devotion to duty,	2
	Efficiency, Accountability	
4.2	Respect for learning /learned, Willingness to learn-Open	1
	and balanced mind	
4.3	Team spirit, Professional Ethic, Willingness for Discussion,	2
4.4	Aims, Effort, Avoidance of Procrastination and	1
	slothfulness, Alertness	
5	BEHAVIOURAL VALUES	
5.1	Individual values and group values, Good manners at	1
	home and outside	
5.2	Equality, Purity of thought, speech and action	2
5.3	Understanding the role of religion, Faith, Understanding	2
	the commonness of religions, respect for other faiths,	
	unity in diversity	
5.4	Living together, Tolerance, Non-violence, Truthfulness,	2
	Common aim, Unified effort towards peace, Patriotism	
	TOTAL	26

Course compilers:

- 1. Jinu Louishidha Kitchley jinujoshua@tce.edu
- 2. P. Shabitha

psarch@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA64	2	-	-	2

ARA64 ADVANCE STRUCTURES

2:0

Preamble:

This course is introduced to expose the students to various types of progressive structures and provide basic knowledge about the factors to be considered while designing such structures.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Understand the concept of High rise, Long span, shell, flat slabs, tensile and pneumatic structures.
- 2. Understand the structural and construction issues involved with each type of structure.
- 3. Appreciate the design of each structure.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

High Rise Structures: Theory and principles for structural design of High rise structures-Different loads and forces acting on High rise structures - Frame: Types of frames, Planning layout of frames for high rise buildings-Loads to be considered for design: Methods of analysis for vertical and horizontal load - Theory of portal method-cantilever method-substitute frame method. **Long Span Structures:** Structural issues – design issues – construction issues – Long span girders and trusses. Launching and erection details – segmental construction. **Shells and folded plates:** Introduction to shell structures – various forms and

classification of shells – Analysis of shells by theorem – Introduction to folded plates – types of folded plates – Elements of folded plates – structural action on folded plates. **Pneumatic and tensile structures:** Introduction to cable structures – principles of cable stayed bridges. Well steining caisson foundation, Design principle of Masts and Trestles. **Flat slabs:** Design of flat slabs (IS Method), drop panels and column capitals.

Text Books:

- 1. Dr.B.C.Punmia ,Ashok Kumar Jain,Arun Kumar Jain"Comprehensive Design of Steel Strucure" Lakshmi Publication" (P)Ltd,New Delhi ,1998
- 2. Dr.B.C.Punmia ,Ashok Kumar Jain,Arun Kumar Jain"Comprehensive RCC Design" Lakshmi Publication" ,(P)Ltd,New Delhi ,1998.
- Sinha.M.C., Roy S.K. "Fundamentals of Prestressed Concrete" S.Chand and Company, NewDelhi, 1998.
- 4. KrishnaRaju.N. Design of Bridges CBS Publications ,NewDelhi ,2001.
- KrishnaRaju.N."Advanced Reinforced Concrete Design"CBS Publishers and distribushers, NewDelhi, 1998

References:

- 1. Ragupathi.M. "Design Of Steel Structures", Tata McGraw Hill Publishing Co, NewDelhi, 1995
- Arthur H.Nilson, George Winter "Design Of Rcc Structures", Tata McGraw Hill Publishing Co, Newyork, 1972
- Lin T.Y. & Ned H.Burns: Design of Prestressed Concrete Structures" John Wiley and Sons, NewYork 1981.

4. Ponnusamy "Bridge Engineering", Tata McGraw Hill Publishing Co,NewDelhi, 1995.

IS Codes:

- 1. IS 800 2000 Code Of Practice for General Construction in Steel.
- S.P. 6 Part I 1964 HandBook for Structural Engineering Part I, Structural Steel Sections.
- 3. IS 456 2000 Code of Practice Plain and Reinforced Concrete
- 4. SP 16 : 1980 Design Aids for Reinforced Concrete to IS 456 1978
- 5. IS 87S(1-5)1987 Code of Practice for Design Loads (Other than Earthquake) for buildings and structures.
- 6. IS 1343:1980 Code of Practice for Prestressed Concrete
- IRC 45-1972"Recommondations for Estimating the resistance of soil below the maximum scour level in the Design of well foundation of Bridges.

Course content and lecture schedule:

S.No.	Торіс	No. of
		lectures
1	High Rise Structures	
1.1	Theory and principles for structural design of High rise	1
	structures	
1.2	Different loads and forces acting on High rise	1
1.3	Frame: Types of frames, Planning layout of frames for	1
		-
1.4	Loads to be considered for design: Methods of analysis	1
15	Theory of portal method captileyor method substitute	2
1.5	frame method.	2
2	Long Span Structures	
2.1	Structural issues – design issues – construction issues	1
	-	
2.2	Long span girders and trusses - Launching and	
	erection details – segmental construction.	2
3	Shells and folded plates	
3.1	Introduction to shell structures - various forms and	2
	classification of shells – Analysis of shells by theorem	
3.2	Introduction to folded plates – types of folded plates –	3
	Elements of folded plates – structural action on folded	
	plates.	
4	Pneumatic and tensile structures	
4.1	Introduction to cable structures – principles of cable	2
4.2	stayed bridges Well Steining caisson foundation	1
4.3	Design principle of Masts and Trestles	4
5	Flat slabs	
5.1	Design of flat slabs (IS Method)	3
5.2	Drop panel and column capital	2
0.2		~

S.No.	Торіс	No. of
		lectures
	TOTAL	26

Course Designers:

- 1. Dr. K.Sudalaimani ksudalaimani@tce.edu
- 2. P.Ananthalakshmi anantha@tce.edu
- 3. A.N. Elavezhiman anearch@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits				
ARA65	2	-	4	4				

ARA65 HOUSING

2:2

Preamble:

This course is intended to expose the students about the housing scenario in the Indian Context and factors affecting housing design. It is imperative for the students to learn the Housing project formulation techniques and Housing Design strategies to be competent enough in the growing housing market.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies

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

- 1. Acquire knowledge on Housing Development aspects
- 2. Have an insight on Housing project Formulation.
- 3. Sensitively approach Housing design.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	40	40	40
4	Analyse	40	40	40
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Housing Issues - Indian Context: Definitions - Dwelling Unit, Household, Housing , Housing Need and Housing Supply- Housing Density – Emerging Issues of Housing in the Indian Context - Salient Features of National Urban Housing and Habitat Policy 2007 - Role of Housing Agencies towards the housing development in Post Independence Era. Housing Types: Villa, Apartments, Condominium, Core Housing, Cooperative housing, Employee Quarters, Slums and Squatters – Its Characteristics, Tenureship, Problems and Issues - Housing Concepts by Charles Correa, B.V. Doshi and Rejrewal. Housing schemes and case studies: Site and Services, BSUP & RAY, IAY - Case studies for Traditional Housing – High Rise Housing and New Townships. Exercise on analysis of housing case studies. Housing Standards and Project Formulation: DCR relevant to Housing- Special Building Rules - Performance standards - Various stages and tasks in Project Development – Feasibility study- Contextual analysis - Demand assessment and Requirement Formulation - Report Writing. Exercise on Feasibility Study Report preparation. Housing Design Methodology : Factors affecting Housing Design -Socio - Economical and Cultural - Affordability-Resources Housing Layout concepts - Row housing, Terrace Housing, Patio Housing, Cluster Housing - Hierarchy of Roads and its characteristics - Parking -Hierarchy of open Space and its characteristics Utilities and Common Facilities – Services - Housing Management and Community participation. Exercise on Housing Design Methodologies.

Text Books:

 Christopher Alexander, A Pattern Language, Oxford University Press, New York - 1977.
2. Joseph de chiara & others - Time Saver Standards for Housing and Residential development, McGraw Hill Co., New York, 1995.

Reference Books:

- Richard Untermanu & Robert Small, Site Planning for Cluster Housing, Van Nostrand Reinhold Company, London/New York, 1977.
- 2. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.
- 3. HUDCO Publications Housing for the Low income, Sector Model.

Course content and lecture schedule:

S. No.	Торіс	No. of
		lectures
1	Housing Issues - Indian Context	
1.1	Definitions – Dwelling Units, Household, Housing Need and Housing Demand	2
1.2	Emerging Issues of Housing in the Indian Context	2
1.3	Salient features of National Urban Housing and Habitat Policy	2
1.4	Role of Housing Agencies in the housing development in Post Independence Era	2
2	Housing Types	
2.1	Villa, Apartments, Condominium, Core Housing, Cooperative housing, Employee Quarters	2
2.2	Slums and Squatters	2
2.3	Housing Concepts by Charles Correa, B.V. Doshi, Rejrewal	2
3	Housing schemes and case studies	
3.1	Site and Services, BSUP & RAY , IAY - Its Characteristics, Tenureship, Problems and Issues	2
3.2	Case studies for Traditional Housing- Its Characteristics, Tenureship, Problems and Issues	2
3.3	Case studies - High Rise Housing and New Townships - Its Characteristics, Tenureship, Problems and Issues	2
	Exercise on analysis of housing case studies.	12
4	Housing Standards and Project Formulation	
4.1	DCR relevant to Housing- Special Building Rules - Performance standards	2
4.2	Various stages and tasks in Project Development	2
4.3	Feasibility study- Contextual analysis - Demand assessment and Requirement Formulation	2
4.4	Report Writing	2

S. No.	Торіс	No. of
		lectures
4.5	Exercise on Feasibility Study Report preparation	16
5	Housing Design Methodology	
5.1	Factors affecting Housing Design Socio – Economical and Cultural – Affordability- Resources	2
5.2	Housing Layout concepts – Row housing, Terrace Housing, Patio Housing, Cluster Housing, Hierarchy of Roads and its characteristics – Parking, Hierarchy of open Space and its characteristics, Utilities and Common Facilities - Services	2
5.3	Housing Management and Community participation	1
5.4	Exercise on Housing Design Methodologies.	24
	TOTAL	85

- 1. V. Balasubramanian- vbsarch@tce.edu2. N. Elavezhimaan- ane@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA66	3	-	2	4

ARA66 BUILDING SERVICES AND TECHNOLOGY III

Preamble:

Building services in modern buildings involves the design, installation, operation and monitoring of the mechanical, electrical and public health systems required for the safe, comfortable and environmental friendly operations. This course has been designed to understand the basic concepts and systems of various services involved in modern buildings. In this course the services addressed are the study of Acoustics, Heating, Ventilation and Cooling.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multifaceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment

Competencies:

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

1. Understand the importance of acoustical environment in the building design.

2. Apply the knowledge in evolving an acoustical environment for creating a better living.

3. Understand the basic principles of air-conditioning and refrigeration, various systems

and their application in built environment.

4. Apply the knowledge in load calculation and criteria for selecting an airconditioning system.

Assessment Pattern:

	Blooms	Test	Test	Test 3 / End
	Category	1	2	semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyze	15	15	15
5	Evaluate	0	0	0
6	Create	15	15	15

Concept map:



Syllabus:

ARCHITECTURAL ACOUSTICS

Introduction and theory of sound: Acoustics - Definitions, terms related to acoustics - Theory of sound - measurement of sound, sound pressure, scales-decibel scale. Characteristics of speech and music - distribution of energy in speech and music frequencies, intelligibility of speech, high fidelity reproduction of music. Human ear characteristics making of sound, Behaviour of sound in enclosed spaces. **Acoustics** : Resonance, reverberation, echo, reverberation time - Sound absorption, absorption co-efficient and measurements, Sound absorbing materials used and their choices - Sound insulation - Walls/partitions, floors/ceilings, window/doors, insulating fittings and gadgets, machine mounting and insulation of machinery. Sources and types of noise- Characteristics and effect of noise -impact on human beings/ behavior, noise control for buildings.

Exercise using Sabine's formula / exercises involving reverberation time and absorption co-efficient. Acoustical Design of built spaces: Acoustical requirements of different types of built environment - Site selection, shape, volume, treatment for interior surfaces, basic principles in designing cinemas, broadcasting studios, concert halls, class rooms, lecture halls and auditoriums - Environmental acoustics legislature - related to transportation, examples- airports, railway stations, railway tracks, MRTS etc. *Exercise: Acoustical design of a lecture hall / classroom, etc.*

HEATING, VENTILATION AND COOLING (HVAC)

Basic Refrigeration Principles, Cycle and Systems Components: Refrigeration principles and Definitions, terms related to Refrigeration - Laws of thermodynamics - Air-conditioning capacity - Introduction to refrigeration components, Air-handling units, cooling towers, fan coil units, ducts, grills and diffusers, mounting of outdoor units- Refrigeration cycle - Vapour compression and Vapour absorption cycle. Air conditioning: Systems and applications: Window unit, Split unit and Packaged terminal units – Centralized air conditioning system. Thumb rules for Configuring/ sizing of mechanical equipment, equipment spaces and sizes for chiller plant, cooling tower, Fan room, Circulation Pumps, Pipes, ducts. Air conditioning: Design criteria: Procedure for Cooling load calculations. Design criteria for selecting the Air conditioning system for small and large building and energy conservation measures - Horizontal distribution of services for large buildings - Grouped horizontal distribution over central corridors, Above ceiling, In floor, Raised access floor. Protection against fire to be caused by AC systems, noise control in AC, water piping. Design of Air conditioning systems based on Cooling load calculations for small built space.

Text Books:

- 1. Leslie Doelle, Environmental Acoustics, McGraw-Hill 1972.
- Dr.V.Narasimhan, An Introduction to Building Physics, Kabeer Printing Works, Chennai, 1974.
- 3. M.H.Lulla, Handbook of Air-conditioning system.

Reference Books:

1. D.J.Groomet - Noise, Building and People, Pergumon Press - 1977.

2. Thomas D.Northwood - Architectural Acoustics - Dowden, Hutchinson and Ross Inc. -

1977.

3. B.J.Smith, R.J.Peters, Stephanie Owen - Acoustics and Noise Control - Longman

Group Ltd., New York, USA - 1982

4. William H.Severns and Julian R.Fellows, Air-conditioning and Refrigeration,

John

Wiley and Sons, London, 1988

Course content and lecture schedule:

S. No.	Торіс	No of
		Lectures
	Architectural Acoustics	
1.	Introduction and theory of sound	
1.2	Definitions, terms related to acoustics - Theory of sound -	3
	measurement of sound, sound pressure, scales- decibel	
	scale.	
1.3	Characteristics of speech and music - distribution of energy	3
	in speech and music frequencies, intelligibility of speech, high	
	fidelity reproduction of music	
1.4	Human ear characteristics making of sound, Behavior of	2
	sound in enclosed spaces.	
2.	Acoustics	
2.1	Resonance, reverberation, echo, reverberation time - Sound	2
	absorption, absorption co-efficient and measurements	
2.2	Sound absorbing materials used and their choices - Sound	3
	insulation - Walls/partitions, floors/ceilings, window/doors,	
	insulating fittings and gadgets, machine mounting and	
	insulation of machinery.	
2.3	Sources and types of noise- Characteristics and effect of	2
	noise -impact on human beings/ behavior, noise control for	
	buildings.	
2.4	Exercise using Sabine's formula / exercises involving	10
	reverberation time and absorption co-efficient	
3.0	Acoustical Design of built spaces	
3.1	Acoustical requirements of different types of built	2
	environment - Site selection, shape, volume, treatment for	
	interior surfaces	
3.2	basic principles in designing cinemas, broadcasting studios,	3
	concert halls, class rooms, lecture halls and auditoriums -	
3.3	Environmental acoustics legislature - related to	
	transportation, examples- airports, railway stations, railway	

	tracks, MRTS etc.			
3.4	Exercise: Acoustical design of a lecture hall / classroom, etc.	5		
4.0	Heating, Ventilation And Cooling (HVAC)			
4.1	Refrigeration principles and Definitions, terms related to	2		
	Refrigeration			
4.2	Laws of thermodynamics – Air-conditioning capacity –	2		
4.3	Introduction to refrigeration components, Air-handling units,	2		
	cooling towers, fan coil units, ducts, grills and diffusers,			
	mounting of outdoor units			
4.4	Refrigeration cycle - Vapour compression and Vapour	2		
	absorption cycle			
5.0	Air conditioning: Systems and applications			
5.1	Window unit, Split unit and Packaged terminal units –	2		
5.2	Centralized air conditioning system.	2		
5.3	Thumb rules for Configuring/ sizing of mechanical equipment,	2		
	equipment spaces and sizes for chiller plant, cooling tower,			
	Fan room, Circulation Pumps, Pipes, ducts.			
5.4	Procedure for Cooling load calculations.	10		
5.5	Design criteria for selecting the Air conditioning system for	2		
	small and large building and energy conservation measures			
5.6	Horizontal distribution of services for large buildings	2		
5.7	Grouped horizontal distribution over central corridors, Above	2		
	ceiling, In floor, Raised access floor.			
5.8	Protection against fire to be caused by AC systems, noise	2		
	control in AC, water piping.			
5.9	Design of Air conditioning systems based on Cooling load	10		
	calculations for small built space.			
	Total Periods	70		
		1		

- 3. S.Karthikeya Raja
- 4. A.Madhumathi

skrarch@tce.edu madhu@tce.edu

BOARD OF STUDIES MEETING ON 24.04.2010

Sub Code	Lectures	Tutorials	Practical	Credits
ARA67	-	-	14	7

ARA67 ARCHITECTURAL DESIGN V

0:7

Preamble:

The process of Architectural Design involves the proper understanding and effective application of services in the design of buildings. This architectural design studio undertakes comprehension of spaces in multiple level planning and incorporation of services such as electrical, plumbing and lighting.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competencies

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

- 1. Recognize the various standards, functional activities and hierarchy of activities in multiple user, multiple units and multiple level building plans.
- Comprehension of the issues involving circulation pattern and building services in multi level planning, planning aspects for disability and elderly, working and detail drawing techniques.
- 3. Correlate various influencing factors of a design such as function, activities, spatial standards, form, volumetric definition, etc.
- 4. Analyze design aspects for disability and elderly.

- 5. Design spaces involving multiple users, multiple units and multiple level building plans.
- 6. Develop skills in preparing working drawing and detail drawing techniques.

Syllabus:

Exercises involving multiple users, multi level movement with complex circulation pattern, campus planning, building services, and design aspects for disability and elderly, such as institutional buildings, office complex, museums, etc. Application of acquired technical drawing and presentation skills in preparing detailed working drawings.

Reference Books:

- De Chiara and Callender, Time saver standards for Building Types, Mc Graw Hill Co., New York, 1973.
- 7. Nufert Ernst, Architects Data, Blackwell Science Ltd., Britain, 1980.
- 8. Sir Christopher Alexander, A Pattern Language: Towns, Buildings, Construction, Oxford University Press, 1977.
- 9. Sir Christopher Alexander, The Timeless way of building, Oxford University Press, 1979.
- **10.** Julius Panero, Martin Zelick, Human Dimension and Interior Space, Whitney Library of Design, Canada- 1979

Course Designers:

- 1. G.Balaji gbarch@tce.edu
- 2. P.Vivek pvkarch@tce.edu

ARA7PT PRACTICAL TRAININGI 0:10

Preamble:

Practical Training is introduced to expose the students to Professional Practice and get hands on training under the guidance of an architect who is actively engaged in Architectural Practice. This helps them in gaining practical knowledge in office and on the site.

Program Outcome:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multifaceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields/ industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competencies:

At the end of the Course, the student will be able to

 Acquaint himself/herself with various works like Conceptual drawings, presentation skills, client meetings, development of the concepts into working drawings, involvement in office discussions, office Management, Human Resource Management, new techniques of construction, advance building services, landscape and environmental designing, procedures etc. of building trade.

Syllabus:

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture. The choice of the place of training shall be Architectural Firms, Organisations, Development Authorities etc which are headed by Registered Architects. The students shall work for a period of 120 working days of the semester. The choice of the office shall be approved by the Head of the Department of Architecture.

The Evaluation shall be based as per the Regulations. The evaluation of the Practical Training will be based on the following features:

- 1. Site supervision
- 2. Concept development and critical study of the project to be built.
- 3. Schematic Drawings and Presentation drawings
- 4. Working drawings.
- 5. Estimation.

The student is expected to deliver

- 1. A critical appraisal of a project done by the office
- 2. Set of working drawings/ approval drawings for one project.

Sub Code	Lectures	Tutorials	Practical	Credits
ARA8PT	-	-	30	10

ARA8PT PRACTICAL TRAININGII 0:10

Preamble:

Practical Training is introduced to expose the students to Professional Practice and get hands on training under the guidance of an architect who is actively engaged in Architectural Practice. This helps them in gaining practical knowledge in office and on the site.

Program Outcome:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multifaceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields/ industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.

Competencies:

At the end of the Course, the student will be able to

 Acquaint himself/herself with various works like Conceptual drawings, presentation skills, client meetings, development of the concepts into working drawings, involvement in office discussions, office Management, Human Resource Management, new techniques of construction, advance building services, landscape and environmental designing, procedures etc. of building trade.

Syllabus:

The internship program would be done in offices empanelled by the Institution and in firms registered under the Council of Architecture. The choice of the place of training shall be Architectural Firms, Organisations, Development Authorities etc which are headed by Registered Architects. The student can undertake Practical Training in the VII or the VIII semester in one Architectural office or could change his/her office of Practical training in the VIII semester if the candidate wishes. The students shall work for a period of 120 working days of the semester. The choice of the office shall be approved by the Head of the Department of Architecture.

The Evaluation shall be based as per the Regulations. The evaluation of the Practical Training will be based on the following features:

- 1. Site supervision
- 2. Concept development and critical study of the project to be built.
- 3. Schematic Drawings and Presentation drawings
- 4. Working drawings.
- 5. Estimation.

The student is expected to deliver

- 1. A critical appraisal of a project done by the office
- 2. Set of working drawings/ approval drawings for one project.

Preamble:

As a culmination of five semesters of study in B.Arch course the students are focused the professional norms, standards and ethics They are made to understand the formation of Council of Architecture (C.O.A) and I.I.A (Indian Institute of Architects) - the professional society, and are elaborated the role of C.O.A in Architectural education and profession. This subject paves way to the budding Architects about the Profession. The building bye laws, norms, standards and other Building Codes like NBC are elaborately discussed and taught so as to apply in their Professional practice.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course the students will be the able to

- 1. Understand the Building norms, standards, Bye laws etc.
- 2. Competent to handle projects individually.
- 3. Competent to establish and run an Architect's Office on their own.

Assessment Pattern:

S. No.	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	60	60	60
4	Analyse	0	0	0

5	Evaluate	0	0	0
6	Create	0	0	0

Concept map:



Syllabus:

Introduction to Architectural Profession: Importance of Architectural Profession - Role of Architects in Society - Alternatives open on entering the profession - Registration of Architects - Architect's office and its management location, organization structure, responsibility towards employees, consultants and associates, elementary accounts, tax liabilities. Professional Ethics and Code of Conduct: Role of Indian Institute of Architects - Architects Act 1972 intent, objectives, provisions with regard to architectural practice - Council of Architecture - role and functions – Importance of ethics in professional practice (Council of Architecture guide lines) - Code of conduct for architects as prescribed by Council of Architecture, punitive action for professional misconduct of an architect. Architects Services and Scale of fees: Mode of engaging an architect - Comprehensive services, partial services and specialised services -Scope of work of an architect – Schedule of services – Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement. Architectural Competitions: Importance of Architectural competitions – Types of competitions -open, limited, ideas competition - Single and two stage competitions - Council of Architecture guidelines for conducting Architectural competitions -International Competitions -case studies. Legal aspects and

legislation: Copy rights and patenting –provisions of copy right acts in India and abroad, copy right in architectural profession – Easement –meaning, types of casements, acquisition, extinction and protection – Development Regulations in Second master plan for Chennai Metropolitan Area, Chennai Corporation Building rules 1972 – The Panchayat rules 1940 – Persons with Disabilities Act -provisions, responsibilities of architect and local body on creating barrier free.

Text Books:

- 1. Publications of COA, Hand book on Professional Practice, The Architects publishing Corporation of India, Bombay, 1987
- 2. Roshan Namavathi, Professional Practice, Lakhsmi Book Depot, Mumbai, 1984.
- 3. Architects Act 1972.
- 4. Architectural Competition guidelines, 1989.

References Books:

- 1. J.J. Scott, Architect's Practice, Butterworth, London 1985
- 2. D.C. Rules for Chennai Metropolitan Area 1990
- 3. T.N.D.M. Building Rules, 1972
- 4. T.N.P. Building Rules 1942
- 5. Chennai City Corporation Building Rules 1972
- Derek Sharp, The Business of Architectural Practice William Collins Sons & Co. Ltd, 8 Erafton St., London W1 1986

Course content and lecture schedule:

S. No.	Торіс	No. of lectures
1.0	Introduction to the Architectural Profession	
1.1	Importance of Architectural Profession	1
1.2	Role of Architects in Society – Alternatives open on entering the profession	2
1.3	Registration of Architects	1
1.4	Architect's office and its management (Location, organization structure, responsibility towards employees, consultants and associates, elementary accounts, tax liabilities).	2
2.0	Professional Ethics and Code of Conduct	
2.1	Role of Indian Institute of Architects.	1
2.2	Architects Act 1972 (intent, objectives, provisions with	2

	regard to architectural practice)	
2.3	Council of Architecture (role and functions)	2
2.4	Importance of ethics in professional practice (Council of Architecture guide lines)	1
2.5	Code of conduct for architects as prescribed by Council of Architecture, punitive action for professional misconduct of an architect.	1
3.0	Architect's Services & Scale of Fees	
3.1	Mode of engaging an architect	1
3.2	Comprehensive services, partial services and specialised services	1
3.3	Scope of work of an architect – Schedule of services	1
3.4	Scale of fees (Council of Architecture norms) – Mode of payment – Terms and conditions of engagement.	1
4.0	Architectural Competitions	
4.1	Importance of Architectural competitions	1
4.2	Types of competitions (open, limited, ideas competition) - Single and two stage competitions	1
4.3	Council of Architecture guidelines for conducting Architectural competitions –International Competitions (case studies).	1
5.0	Legal Aspects & Legislation	
5.1	Copy rights and patenting – (provisions of copy right acts in India and abroad	1
5.2	copy right in architectural profession)	1
5.3	Easement – (meaning, types of casements, acquisition, extinction and protection).	1
5.4	Development Regulations in Second master plan for Chennai Metropolitan Area, Chennai Corporation Building rules 1972	1
5.5	The Panchayat rules 1940 – Persons with Disabilities Act (provisions, responsibilities of architect and local body on creating barrier free.	1

Total periods	26

- 1. S. Radhakrishnan <u>srkarch@tce.edu</u>
 - S.Subhashini <u>ssarch@tce.edu</u>

Sub Code	Lectures	Tutorials	Practical	Credits
ARA92	3	-	-	3

2.

ARA92 Urban Design

3:0

Preamble:

Urban design involves the organization and design of buildings, public spaces, transport systems, and services in an urban level. This course is introduced to make the student understand the connections between people and places, movement, nature and the built fabric and to understand the management of public space and the way public places are experienced and used.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 7. Discern the urban spaces in various contexts for planning.
- 8. Understand the form, pattern, organization of urban spaces for planning solutions.

- 9. Analyze urban spaces in historic context, its organization and articulation for various uses of residential, entertainment, industrial and commercial values.
- 10. Apply the values of spatial organization, planning regulations for providing solutions for urban situation.

Assessment Pattern:

	Blooms	Test 1	Test 2	Test 3 / End semester
	Category			Examination
1	Remember	10	10	10
2	Understand	10	10	10
3	Apply	40	40	40
4	Analyse	40	40	40
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction to urban design: Relationship between Architecture, Urban Design and Town Planning - Role of an urban designer - Perception of city form

and pattern – Townscape elements – *Visual Survey Exercises.* **Urban spaces in history:** Comparative analysis of public spaces, their organisation and articulation in pre-History, Greek, Roman, Mediaeval and Renaissance periods in west and east - Urban spaces in Indian context. **Organisation of urban spaces:** Perception of city form and pattern, Understanding, organizing and articulation of spaces for various uses - Residential, Commercial, Industrial and Recreational areas - **Contemporary Practice:** Townscape policies, bye-laws, regulations, Planning and Finance for urban design, Emerging areas of development – Contemporary Urban proposals. *Exercise: Literature case study of a contemporary urban proposals.* **Urban interventions, methods and proposals:** Urban intervention characteristics - Parameters for identifying type of intervention, objectives, surveys - Urban renewal - redevelopment of urban spaces, role of public participation.

Text books:

- Paul.D. Spriregen, "On the out of designing cites", M.I.T.Press, Cambridge, 1968
- 2. Lynch .Kevin, "The Image of the city", M.I.T.Press, Cambridge, 1960
- 3. Bacon. Edmund, "Design of Cities", Thames & Hudson, London, 1967
- 4. Gordon Cullen, "The concise TOWNSCAPE", The Architectural Press, 1978

Reference Books:

- 1. Lawrence Halprin, "CITIES", Reinhold Publishing Corporation, N.Y., 1964.
- 2. Gosling and Maitland, "URBAN DESIGN", St.Martin's Press, 1984.
- Jonathan Barnett, "An Introduction to Urban Design", Harper & Row Publishers, N.Y., 1982

Course content and lecture schedule:

S.No	Торіс	No of
		Lectures
1.0	Introduction to urban design	
1.1	Relationship between Architecture, Urban Design and	1
	Town Planning.	
1.2	Role of an urban designer	1
1.3	Perception of city form and pattern – Townscape	2
	elements	
1.4	Exercise: Visual Survey	9
2.0	Urban spaces in history	
2.1	Comparative analysis of public spaces, their	3
	organisation and articulation in pre-History, Greek,	

S.No	Торіс	No of
		Lectures
	Roman, Mediaeval and Renaissance periods in west	
	and east.	
2.2	Urban spaces in Indian context	3
3.0	Organisation of urban spaces	
3.1	Perception of city form and pattern,	2
3.2	Understanding, organizing and articulation of spaces	3
	for various uses - Residential, Commercial, Industrial	
	and Recreational areas.	
4.0	Contemporary Practice	
4.1	Townscape policies, bye-laws, regulations, Planning	1
	and Finance for urban design,	
4.2	Emerging areas of development – Contemporary	3
	Urban proposals	
4.3	Exercise: Literature case study of a contemporary	9
	urban proposals	
5.0	Urban interventions, methods and proposals	
5.1	Urban intervention -characteristics.	1
5.2	Parameters for identifying type of intervention,	1
	objectives, surveys.	
5.3	Urban renewal - redevelopment of urban spaces, role	1
	of public participation.	
	TOTAL	40

- 1. J.Jinu Louishidha Kitchley
- 2. P.Vivek

jinujoshua@tce.edu pvkarch@tce.edu ssiarch@tce.edu

3. S.Santhana Iyappa Sundararaj

B.ARCH – FIRST AND SECOND SEMESTERS 2010-11

Subject Code	Lectures	Tutorials	Practical	Credits
ARA93	2	-	-	2

ARA93 PROJECT MANAGEMENT

2:0

Preamble:

The course aims at enhancing the ability to manage projects through the project management techniques and to get exposed to the network techniques and its application in project management.

Programme Outcome addressed:

- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course, the student will able to

- 1. Know the basics of project management, their tools and techniques
- 2. Understand the Network Scheduling-PERT and CPM
- 3. Understand the Project Programming and apply the concepts in architectural projects.
- 4. Analyze the Project Cost, Resource Management and Duration of the Project.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction to Project Management-Introduction to project Management concepts - background of management, purpose, goal and objectives. Traditional management system, Gantt's approach-bar chart, merits and limitation, advancement, Project programming, work breakdown schedule-**Network Scheduling-Introduction** to scientific management techniques – PERT & CPM, network concepts, elements and interrelationships. Network techniques,

logic activity information, development of network, CPM for management, CPM network analysis, Identification of critical path, float, and computation result sheets- **PERT Network -** Introduction to theory of probability and statistics, PERT network, Probabilistic time estimation for the activities, Analysis of PERT network-**Project Programming-** Project programming, resource allocation balancing- leveling and smoothing techniques, Phasing of activities, Project scheduling and control, Project updation- **Project Cost -**Introduction - Activity cost information, cost time relationship, crashed estimates, cost slope, direct and indirect project cost, Crashed program, least cost solution, least time solution, Optimum time solution.

Text Books:

- Dr. C. Punmiya and K.K. Khandelwal, Project Planning and Control with PERT\CPM Laxmi Publications, New Delhi, 1987.
- 2. Jerome D. Wiest and Ferdinand K. Levy, A Management guide to PERT/CPM, Prentice Hall of Indian Publications Ltd., New Delhi, 1982.

References:

- S.P.Mukhopadyay, Project Management for Architets and Civil Engineers, IIT, Kharagpur, 1974.
- 2. R.A.Burgen and G.White, Building Production and Project Management, The Construction Press, London, 1979.

Course content and lecture schedule:

S. No	Торіс	No of
		Lectures
1.0	Introduction to Project Management-	
1.1	Introduction to project Management	1
	concepts - background of management, purpose, goal	
	and objectives	
1.2	Traditional management system, Gantt's approach-bar	2
	chart, merits and limitation, advancement	
1.3	Project programming, work breakdown schedule	2
2.0	Network Scheduling, Management Techniques-	
	PERT & CPM	
2.1	Introduction to scientific management techniques -	2
	PERT & CPM, network concepts, elements and	
	interrelationships	
2.2	Network techniques, logic activity information,	2

S. No	Торіс	No of
		Lectures
	development of network	
2.3	CPM for management, CPM network analysis,	2
	Identification of critical path, float, and computation	
	result sheets	
2.4	PERT Network-Introduction to theory of probability and	3
	statistics, PERT network, Probabilistic time estimation	
	for the activities, Analysis of PERT network	
3.0	Project Programming	
3.1	Project programming, resource allocation balancing-	3
	leveling and smoothing techniques	
3.2	Phasing of activities, Project scheduling and control,	3
	Project updation	
4.0	Project Cost	
4.1	Introduction - Activity cost information, cost time	3
	relationship, crashed estimates, cost slope, project	
	direct and indirect cost,	
4.2	Crashed program, least cost solution, least time	3
	solution, Optimum time solution.	
	TOTAL	26

1. J.Jinu Loushida Kitchley

jinujoshua@tce.edu

2. G.Chithra

gcciv@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA9K	2	-	2	3

ARA9K Landscape Design

2:1

Preamble:

The scope of landscape architecture ranges from micro level landscapes to complex site planning issues, to macro level issues such as regional landscape planning and ecological conservation. However the scope of the subject at the architectural curriculum would be restricted to micro level and site planning level and to landscape issues closely related to architectural design, thereby extending the scope of design at schools of architecture beyond the building envelope to outdoor spaces and site ecology.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course the students will be the able to

- 1. Understanding the site and its context while designing siting of buildings.
- 2. Create and design open space structure on the site, and further achieving aesthetical, functional and environmental goals.
- 3. Use landscape elements both to create and enhance exterior spaces and to achieve passive climatic control at the building site level.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyze	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Elements of Landscape design: Plants as design elements – structural characteristic of plants – visual characteristics of plant viz. line, form, texture, colour, etc. – basic data for plant selection, Water and Landform - Landscape character – Landscape Composition - Landscape effects. Exercise: Composition of small scale landscape reflecting a landscape character. **Styles of Landscape Design- Historic:** Study of principles and design – historic styles – Mughal gardens of India: Shalimar Bagh and Taj Mahal, Japanese gardens: Saihoji, Ryoanji & Katsura imperial palace, Italian Renaissance gardens: Villa Lante at Bagania, American parks: Central park. **Modern gardens:** Roof and terrace garden, indoor garden etc. **Hard and Soft Landscape construction:** Hard Landscape – curb, garden shelters, Seating, Retaining Walls, planters Soft

Landscape- Plant materials, classification, characteristics, use and application in landscape design Street Furniture- garden furniture, lighting fixtures, signage and sign boards, fences. Exercise: Preparation of Hardscape and Softscape Construction Drawings for any small scale design Projects. **Landscaping Design of Functional Areas:** Landscaping for residential layout – recreational facilities, like parks, play fields- water front areas – hill areas – urban centers like squares, plazas - Consideration and key factors to landscaping of above context. Exercise-Landscape Design Exercises for Architectural Design Projects in Previous Semesters.

Text Books:

- 1. John omsbee simonds, Landscape architecture: a manual of site planning and design, McGraw-Hill, 1983.
- 2. Planting Design Theodore D Walker, John Wiley and Sons, 1991.

Reference Books:

- 1. John L.Motloch, Introduction to landscape design, John Wiley and Sons, 2000.
- 2. Nick Robinson, Planting design Handbook, Ashgate Publishing, 1992.
- 3. Joseph dechiara Lee E. Koppelman, Site planning Standards, McGraw-Hill, 1984.
- 4. Glift Tandy, Hand Book of Urban Landscape, The Architectural Press, London, 1971.

Course content and lecture schedule

S.No	Торіс	No. of lectures
1	Landscape Design	
1.1	Elements of Landscape design Plants as design elements	1
1.2	Structural characteristic of plants – visual characteristics of plant viz. line, form, texture, colour, etc. – basic data for plant selection.	2
1.3	Water and Landform Landscape character – Landscape Composition - Landscape effects.	2
	Exercise: Composition of small scale landscape reflecting a landscape character.	4
2	Styles of Landscape Design	
2.1	Historic: Study of principles and design – historic styles – Mughal gardens of India: Shalimar Bagh and Taj Mahal,	3

2.2	Japanese gardens: Saihoji, Ryoanji & Katsura imperial palace,	2
2.3	Italian Renaissance gardens: Villa Lante at Bagania, American parks : Central park.	2
2.4	Modern gardens: Roof and terrace garden, indoor garden etc.	2
3	Hard and Soft Landscape construction	
3.1	Hard Landscape – curb, garden shelters, Seating, Retaining Walls, planters.	2
3.2	Soft Landscape- Plant materials, classification, characteristics, use and application in landscape design	2
3.3	Street Furniture- garden furniture, lighting fixtures, signage and sign boards, fencess	1
3.4	Exercise: Preparation of Hardscape and Softscape Construction Drawings for any small scale design Projects.	12
4	Landscaping Design of Functional Areas	
4.1	Landscaping for residential layout – recreational facilities, like parks, play fields.	2
4.2	water front areas – hill areas – urban centers like squares, plazas	1
4.3	Consideration and key factors to landscaping of above context.	1
	Exercise- Landscape Design Exercises for Architectural Design Projects in Previous Semesters.	16
	Total	55

1.	S. Karthikeyaraja	skrarch@tce.edu
2.	A. Madhumathi	madhu@tce.edu
3.	I. Chandramathy	<u>cmarch@tce.edu</u>
4.	S. Santhanna Iyyappa Sundarraja	pothi@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA9L	2	-	2	3

ARA 9L Architectural Conservation Preamble:

Architectural Conservation being a domain of architecture trains the student to understand the essence of architectural space formation in heritage structures. This enables and sensitizes them toward the significance and values of architectural heritage components. In a way the course guides the student in assessing a built form and enhances the critical evaluation capability in a student. The course offers the student a unique ideology towards the architectural heritage it's tangible and intangible aspects through various methods and means of building diagnosis.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course the students will be the able to

 Understanding the timeless quality achieved through spatial design in heritage

2:1

- 2. Understanding the building assessment indicators and methods
- 3. Analyzing the factors and stages of conservation
- 4. Critically evaluating any heritage built form
- 5. Applying suitable conservation techniques for conserving
- 6. Providing / Creating architectural solutions from conservation perspective

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyze	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction to Architectural Conservation: Definition of the term Conservation with respect to Heritage, Culture and Architecture - Various stages

in Conservation such as Preservation, Renovation, Restoration, Rehabilitation and Consolidation - History of conservation movement in India - Significance and Values of Heritage such as Architectural, cultural, material, social, anthropological etc. **Components in Architectural Conservation:** Architectural Conservation Process – Listing, Inventory, Documentation, Condition Assessment and Structural Assessment - Levels of Architectural intervention in Conservation. *Exercise on components in architectural conservation*. **Architectural Conservation – case examples:** National and International Case studies at Building level, Town level, City level - *Architectural Conservation/ Adaptive reuse for a Simple building / Monument / Precinct / Town.* **Role of national and international agencies in Architectural Conservation:** Introduction to Charters and legislative frame work in Conservation - Indian context - Role of ASI, UNESCO, ICCROM, ICOMOS, Urban Arts Commission, INTACH and other NGOs involved in Conservation - Government policies towards conservation.

Text Book:

- 1. Sir Bernard Feilden, Guidelines for conservation in India, a technical manual, UNESCO, 1989
- 2. Sir Bernard Feilden, An Introduction to Conservation, UNESCO, 1980.
- 3. Sir John Marshall, Conservation manual, INTACH, 1990.

References:

- 1. Scott Greet, Urban Renewal in American Cities, 1998.
- 2. Roy Work Hest, Character of Towns, 1986.
- 3. Donald Apple Yard, Conservation of European cities, 1979.
- 4. Architectural Heritage of Pondicherry, INTACH publication, 2006.

Course content and lecture schedule:

S.No.	Торіс	No. of
		lectures
1	Introduction to architectural conservation	
1.1	Definition of the term Conservation with respect to Heritage, Culture and Architecture.	1
1.2	Various stages in Conservation such as Preservation, Renovation, Restoration, Rehabilitation and Consolidation.	2
1.3	History of conservation movement in India.	1
1.4	Significance and Values of Heritage such as Architectural, cultural, material, social, anthropological etc.	2
2	Components in architectural conservation	

S.No.	Торіс	No. of
		lectures
2.1	Architectural Conservation Process – Listing, Inventory, Documentation, Condition Assessment and Structural Assessment.	2
2.2	Levels of Architectural intervention in Conservation.	2
	Exercise on components in architectural conservation.	12
3	Architectural conservation – case examples	
3.1	National and International Case studies - Building level, Town level, City level.	8
	Architectural Conservation/ Adaptive reuse for a Simple building / Monument / Precinct / Town.	20
4	Role of national and international agencies in architectural conservation	
4.1	Introduction to Charters and legislative frame work in Conservation - Indian context.	2
4.2	Role of ASI, UNESCO, ICCROM, ICOMOS, Urban Arts Commission, INTACH and other NGOs involved in Conservation.	2
4.3	Government policies towards conservation.	1
	Total	55

1. G.Balaji

gbarch@tce.edu

2. Asaithambi,G. gaarch@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA95	-	-	10	5

ARA95 Dissertation

0:5

Preamble:

Dissertation offers an opportunity to understand architecture, history and design primarily through research. It is also intended to enlighten students on the fundamentals of research methods which are very essential for their professional career. Further the course provides an opportunity for the student to carry out investigations on the selected area of study covering various aspects related to architecture and built environment.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competencies:

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

- 1. Acquire Knowledge of research methodology.
- 2. Document, analysis, synthesize and evaluate.
- 3. Acquire Knowledge of technical/report writing.

Syllabus:

The students are expected to choose topics, which are of special interest to them and prepare a report after research. The topics may range from analyzing the works of an architect, history, typological changes, writing, design process and many more.

The report will contain three parts namely,

- 1. Reasons for selecting a particular topic and detailed synopsis of the topic selected.
- 2. Research Methodology adopted which will include personal interviews, written correspondence, questionnaires, sample surveys, photographs, statistical data, literary data and any other supporting documents.
- The last part will contain actual report the Dissertation proposal in approximately 3000 words in prescribed format with its objectives, followed by exhaustive documentation and arguments along with student's inferences, and recommendations.

Text Books:

- Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002
- 2. Research Methods, William M.K Trochium, Bizantra publications, 2003
- 3. Ian Border, Kurt Rueideu, The Dissertation, An Architectural Students Hand Book, Architectural Press, 2000
- 4. The Good Research Guide, Martyn Denscombe, Open University press, 1999.
- 5. Architectural Programming, Donna P.Duerk, Van Nostrand Reinhold, New York, 1993
- 6. Visual Research Methods in Design, Henry Sanoff, Van Nostrand Reinhold, 1991.

Course Designers:

- 1. Ar.Radhakrishnan rkarch@tce.edu
- 2. P.Ananthalakshmi anantha@tce.edu

Sub Code	Lectures	Tutorials	Practical	Credits
ARA96	-	-	14	7

ARA96 Architectural Design VI

0:7

Preamble:

The process of Architectural design is multi dimensional and involves numerous factors such as function, activities, spatial requirements, circulation, aesthetic aspects etc. This architectural design studio undertakes projects pertaining to urban context and campus planning.

Program Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.

Competencies:

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

- 7. Recognize the various standards, functional activities and hierarchy of activities at the campus and urban level.
- 8. Correlate various influencing factors of a design such as function, activities, spatial standards, form, etc.
- 9. Analyse a design question and the formulation of the problem.
- 10. Comprehension of the issues in campus planning and urban scale projects.
- 11. Address issues in designing campuses and urban level design projects.

Syllabus:

The projects shall include problems related to complex urban issues and large scale urban development and urban infra structure pertaining to city / street/ industrial / building level projects.

Text Books:

1. Gordon Cullen, The concise Townscape, The Architectural press, 1978
- 2. Gosling and Maitland, Urban Design, St. Martins Press, 1984.
- 3. Paul.D. Spriregen, "On the out of designing cites" M.I.T.Press, Cambridge, 1968
- 4. Lynch .Kevin, "The Image of the city "M.I.T.Press Cambridge, 1960
- 5. Bacon. Edmund, "Design of Cities", Thames & Hudson, London, 1967

ARA101 Professional Practice II

2:0

Preamble:

As a culmination of five semesters of study in B. Arch course the students are focused the professional norms, standards and ethics They are made to understand the formation of Council of Architecture (C.O.A) and I.I.A (Indian Institute of Architects) - the professional society, and are elaborated the role of C.O.A in Architectural education and profession. This subject paves way to the budding Architects about the Profession. The building bye laws, norms, standards and other Building Codes like NBC are elaborately discussed and taught so as to apply in their Professional practice.

Program Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course the students will be the able to

- 4. Understand the Building norms, standards, Bye laws etc.
- 5. Competent to handle projects individually.
- 6. Competent to establish and run an Architect's Office on their own

Assessment Pattern:

S.No.	Blooms Category	Test 1	Test 2	Test 3 / End
				semester
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	60	60	60
4	Analyse	-	-	-

5	Evaluate	-	-	-
6	Create	-	-	-

Concept map:



Syllabus:

Tender: Types of Tenders-Open and closed tenders-Conditions of tender-Tender documents-Tender notice-Concept of EMD-Submission of tender-Tender scrutiny-Tender analysis Recommendations- E tendering (advantages, procedure, conditions). Contract & Arbitration: Contents of Contract document (Articles of Agreement, Terms and Conditions of Contract, Important clauses – Appendix) – Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award, Conduct of arbitration proceedings) - Arbitration clause in contract agreement (role of architect, excepted matters) - case studies. New Trends in Project Formulation and Execution: Turnkey offer (Expression of interest, Request for Proposal Document, Conditions for inviting turnkey offer, finalisation of the bidder) - Current practices in Project execution [Build operate and Transfer (BOT), Build Operate Lease and Transfer (BOLT) and Build Operate and Own (BOO) and others - case studies. Implications of Globalisation in Architectural Practice: Globalisation (meaning, advantages) – WTO and GATS and their relevance to architectural profession in India - Pre-requisites for Indian architects to work in other countries -Preparedness and infrastructure requirements for global practice - Entry of foreign architects in India (views for and against) – Information Technology and its impact on architectural practice. Emerging Specialisations for an Architect: Construction management (Role, function, and responsibilities of a construction manager) - Project management

(Concept, Objectives, Planning, Scheduling, Controlling and Role and Responsibilities of project manager) – Suitability of architect as construction / project manager – Programme evaluation review Techniques (event, activity, dummy network rules, graphical guidelines for network – PERT network).

Text Books:

- 1. Ar. V.S. Apte, Architectural Practice and Procedure, Padmaja Bhide, Pune, 2008.
- 2. Architects Act 1972.
- Dr. B.C. Punmiya and K.K. Khandelwal, Project Planning and Control with PERT / CPM, Laxmi Publications, New Delhi, 1987.

References:

- 1. Architects Act 1972.
- 2. Publications of Council of Architecture-Architects (Professional conduct) Regulations 1989.
- Roshan Namavati, Professional practice, Lakhani Book Depot, Mumbai 1984.

Course content and lecture schedule:

S.	Торіс	No. of
No.		lectures
1	Tender	
1.1	Types of Tenders-Open and closed tenders	1
1.2	Conditions of tender-Tender documents	1
1.3	Tender notice-Concept of EMD-Submission of tender	1
1.4	Tender scrutiny-Tender analysis Recommendations- E tendering (advantages, procedure, conditions).	2
2	Contract & Arbitration	
2.1	Contents of Contract document (Articles of Agreement, Terms and Conditions of Contract.	1
2.2	Important clauses – Appendix)	1
2.3	Arbitration (Definition, Advantages of arbitration, Sole and joint arbitrators, Role of umpires, Award, Conduct of arbitration proceedings)	2
2.4	Arbitration clause in contract agreement (role of architect, excepted matters) – case studies.	1
3	New Trends In Project Formulation And Execution	

3.1	Turn key offer (Expression of interest, Request for Proposal	1
	Document	
3.2	Conditions for inviting turn key offer, finalisation of the bidder)	1
3.3	Current practices in Project execution Build operate and	2
	Transfer (BOT), Build Operate Lease and Transfer (BOLT) and	
	Build Operate and Own (BOO) and others – case studies.	
4	Implications Of Globalisation In Architectural Practice	
4.1	Globalisation (meaning, advantages), WTO and GATS and	1
	their relevance to architectural	
	profession in India	
4.2	Pre-requisites for Indian architects to work in other countries	1
4.3	Preparedness and infrastructure requirements for global	1
	practice	
4.4	Entry of foreign architects in India (views for and against) -	2
	Information Technology and its impact on architectural	
	practice.	
5	Emerging Specialisations For An Architect	
5.1	Construction management (Role, function, and responsibilities	1
	of a construction manager) –	
5.2	Project management (Concept, Objectives, Planning,	2
	Scheduling, Controlling and Role and Responsibilities of	
	project manager)	
5.3	Suitability of architect as construction / project manager	2
5.4	Programme evaluation review Techniques (event, activity,	2
	dummy network rules, graphical guidelines for network -	
	PERT network).	
	Total	26

Course Designers:

1. S. Radhakrishnan srkarch@tce.edu

2. S.Subhashini

ssarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA10M	2	-	-	2

ARA10M Computation and Design

2:0

Preamble:

This course involves computation and digital technologies as means to explore architecture and the design process. The student will be exposed to a range of applications from stylistic analysis to creative design probing possibilities.

Programme Outcome addressed:

- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course, the student will able to

- 1. Understand the difference between external and internal modelling constraints.
- 2. Understand how to use algorithms as part of a design process
- 3. Create effective graphical algorithms to solve architectural modelling problems.
- 4. Create graphical algorithms to analyze and sort data for conceptual design as well as construction methods.

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester		
				Examination		
1	Remember	20	20	20		

B.ARCH - FIRST AND SECOND SEMESTERS 2010-11

2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	60	60	60
5	Evaluate	0	0	0
6	Create	0	0	0



Syllabus:

Computation and Design – Introduction to Computation and Design – Difference between Digital Process and Non Digital Process – Architecture and Cyber Space – Qualities of the new space – Increased Automatism and its influence on Architectural Form and Space. **Contemporary Process** - Overview of various Contemporary design process and its relation to Computation: Diagrams – Diagrammatic Reasoning – Diagrams and Design Process – Animation and Design – Digital Hybrid Design Protocols – Concept of Emergence – Introduction to Cellular Automata and Architectural applications – Genetic algorithms and Design Computation **Geometries and Surfaces** - Fractal Geometry and their properties – Architectural applications - Works of Zvi Hecker, – Shape Grammar - Shapes, rules and Label -Shape Grammar as analytical and synthetic tools- Works of Stiny, Jose Durate, Gulen Cagdas - Combining Shape grammar and Genetic algorithm to optimize architectural solutions - Works of Gero.J - Hyper Surface– Introduction to Hyper surface and concepts of Liquid architecture.

Text Books:

- 1. Peter Eisenmann, Diagram: An Original Scene of Writing, Diagram Diaries MOVE, UN Studio
- 2. Grey Lynn, The Folded, The Pliant and The Supple, Animate form Contemporary Techniques in Architecture, Halsted Press, 2002
- 3. Ali Rahim, Contemporary Process in Architecture, John Wiley & Sons, 2000

References:

- Walter Benjamin, Practices of Art in the Age of Mechanical Reproduction, Colinpress, 1977
- 2. Work of Architecture in the Age of Mechanical Reproduction, Differences MIT press, 1997.
- 3. William J Mitchell, the Logic of Architecture: Design, Computation and Cognition. MIT Press, Cambridge, 1995
- 4. Marcos Novak, invisible Architecture: An Installation for the Greek Pavilion, Venice Biennale, 2000

Course content and	l lecture schedule:
--------------------	---------------------

S.No	Торіс	No of
		Lectures
1.0	Aspect of Digital Architecture	
1.1	Design and Computation – Difference between Digital	2
	Process and Non-Digital Process	
1.2	Architecture and Cyber Space - Qualities of the new	2
	space	
1.3	Increased Automatism and its influence on	1
	Architectural Form and Space.	
2.0	Contemporary Process	
2.1	Overview of various Contemporary design process and	2
	its relation to Computation: Diagrams – Diagrammatic	
	Reasoning – Diagrams and Design Process	
2.2	Animation and Design – Digital Hybrid Design Protocols	2
2.3	Concept of Emergence - Introduction to Cellular	3
	Automata and Architectural applications	
2.4	Genetic algorithms and Design Computation	3
3.0	Geometries And Surfaces	
3.1	Fractal Geometry and their properties	2

Subject C	Code	Lectures	Tutorials	Practical	Credits			
ARA10N		2	-	-	2			
S.No	No Topic						No of	
							Lectures	
3.2	Arch	itectural a	pplicatior	ns - Work	ks of Zvi	Hecker		2
3.3	Shap	be Gramm	ar - Shap	es, rules	and Lat	pel -		2
	Shap	be Gramr	nar as a	analytical	and s	ynthetic to	ools-	
	Combining Shape grammar							
3.4	Works of Stiny, Jose Durate, Gulen Cagdas							2
3.5	Genetic algorithm to optimize architectural solutions -				ons -	3		
	Hyper Surface- Introduction to Hyper surface and						and	
	concepts of Liquid architecture. Works of Gero.J							
	Total					26		
	Periods							

Course Designers:

6. J. Jinu Louishidha Kitchley jinujoshua@tce.edu

7. I.Chandramathy icarch@tce.edu

ARA10N Services in High Rise Buildings

2:0

Preamble:

The understanding of basic concepts of Services in High rise buildings helps in the integration of services in Architectural Design at the design stage itself. The course enhances the knowledge of Plumbing, Mechanical, Electrical Services in High Rise Buildings. The complexity involved in the safety and security aspects of High rise Buildings is also being addressed.

Programme Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.

g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course, the student will able to

- 1. Understand the importance of service core design.
- 2. Comprehend and analyse the relation of service planning at the design stage itself.
- 3. Understand the various energy management & automation techniques of different services in high rise building buildings.
- 4. Analyse and evaluate any high rise building with respect to the efficiency of its services.

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	0	0	0
4	Analyse	30	30	30
5	Evaluate	30	30	30
6	Create	0	0	0

Assessment Pattern:

Concept Map:



Syllabus:

Service Core: Introduction to services in high rise buildings - Integration of Services - Components of Service Core - Importance of Service Core Design -Design criteria for Service Core - Various service core configurations - Vertical and Horizontal Ducts for various services. Various Service Installation in High Rise Buildings: Types of Water storage and distribution systems in high rise buildings – Types of Sewage Collection systems in high rise buildings – Standards of sanitary services in High Rise Buildings - Refuse Collection & , disposal Selection of pumps Auto Hydro-pneumatic & Pressure Boosting/Control Pumps – Natural and Mechanically-assisted Ventilation Systems for high rise buildings – Air-conditioning systems for Multi-zone, Multi-storey buildings – Planning and Design of elevator systems and services – Planning & Location of Electrical rooms and Distribution Boxes – Power back-up systems – Passive and Active Day Lighting Systems – Security systems at site level & building level: Perimeter Protection & Access Control - Passive Fire Safety Standards for High Rise Buildings as per National Building Code of India -Planning and Design of Fire Detection and Fire alarm Systems – Automation and energy Management of various Services.

Case Studies: Chronology of High rise buildings & Skyscrapers – Integration of Structures & Services with case examples – Mechanical floors – Case examples: Burj Khalifa, Taipei 101, Petranaus Tower, Willis Tower, World Trade Center – Bioclimatic & Eco Skyscrapers: Need for Bioclimatic Skyscrapers with various case examples, Works of Ken Yeang.

Text Books:

 R.Barry, The Construction of Buildings, Volume 5, Affiliated East-West Press Pvt Ltd, New Delhi, 1999. 2. Fred Hall & Roger Greeno, Building Services Handbook, Elsevier, 2005.

References:

- 1. National Building Code of India, 2005
- 2. Frank R.Dagostino, Mechanical and Electrical Systems in Construction and Architecture, Reston Publishing Company Inc., Reston, Virginia, 1978.
- 3. Ken Yeang, Ivor Richards, Bioclimatic skyscrapers, Ellipsis, 1994

Course content and lecture schedule:

S.No	Торіс	No of
		Lectures
1.0	Service Core	
1.1	Introduction to services in high rise buildings,	1
	Integration of Services, Components of Service Core.	·
1.2	Importance of Service Core Design, Design criteria for	1
	Service Core, Various service core configurations.	
1.3	Vertical and Horizontal Ducts for various services.	1
2.0	Various Service Installation in High Rise	
	Buildings	
2.1	Types of Water storage and distribution systems in	1
	high rise buildings.	
2.2	Types of Sewage Collection systems in high rise	
	buildings – Standards of sanitary services in High Rise	1
	Buildings.	
2.3	Refuse Collection & disposal – Selection of pumps,	4
	Auto Hydro-pneumatic & Pressure Boosting/Control	1
	Pumps.	
2.4	Natural and Mechanically-assisted Ventilation Systems	4
	for high rise buildings – Air-conditioning systems for	1
	Multi-zone, Multi-storey buildings.	
2.5	Planning and Design of elevator systems and services.	1
2.6	Planning & Location of Electrical rooms and Distribution	1
	Boxes – Power back-up systems.	
2.7	Passive and Active Day Lighting Systems.	1
2.8	Security systems at site level & building level:	1
	Perimeter Protection & Access Control.	
2.9	Passive Fire Safety Standards for High Rise Buildings	1

S.No	Торіс	No of
		Lectures
	as per National Building Code of India.	
2.10	Planning and Design of Fire Detection and Fire alarm	1
	Systems	
2.11	Automation and energy Management of various	1
	Services.	
3.0	Case Studies	
3.1	Chronology of High rise buildings & Skyscrapers.	1
3.2	Integration of Structures & Services with case	1
	examples.	· ·
3.3	Mechanical floors.	1
3.4	Case example: Burj Khalifa.	1
3.5	Case example: Taipei 101.	1
3.6	Case example: Petranaus Tower.	1
3.7	Case example: Willis Tower.	1
3.9	Case example: World Trade Center.	1
3.10	Bioclimatic & Eco Skyscrapers: Need for Bioclimatic	2
	Skyscrapers with various case examples.	2
3.11	Works of Ken Yeang.	2
	Total Periods	26

Course Designers:

- 1. P. Kabila Sri kabilasri@tce.edu
- 2. I. Chandramathy cmarch@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA100	2	-	-	2

ARA100 Intelligent Buildings

2:0

Preamble:

This course is designed to explore technologies in intelligent buildings which include integration, automation, and optimization of all the services and equipment that provide services and manages the environment of the building concerned.

Programme Outcome addressed:

- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

At the end of the course, the student will able to

- 1. Understand the concept and need of Intelligent buildings.
- 2. Understand the building management systems and technologies.
- 3. Apply these technologies in current building practices

Assessment Pattern:

	Blooms Category	Test 1	Test 2	Test 3 / End semester
				Examination
1	Remember	20	20	20
2	Understand	20	20	20
3	Apply	30	30	30
4	Analyse	30	30	30
5	Evaluate	0	0	0
6	Create	0	0	0

Concept Map:



Syllabus:

Introduction - The emergence of the intelligent buildings- History of intelligent buildings in India, Case Examples- Introduction to the concept of intelligent buildings - Need, purpose and benefit of intelligent buildings. Design of intelligent buildings - Control technologies: Time based & optimizer parameter based. Choosing and installing a building management system. Components of building automation system - Integration of Components of building automation system; HVAC, electrical, lighting, security, fire-fighting, communication, CCTV interface, Energy management system etc.; Management Of Intelligent Buildings - Building energy management – trends and advances in energy management systems, Building management systems for retrofit, Shared tenant services – Performance Evaluation, Software. Networking – Cable management - Fibre optic network design for intelligent buildings - Beyond the intelligent building – EDI (electronic data interchange) and telecommuting. The Future – Intelligent design teams - Expert systems and intelligent building - The future of

communities, buildings and building systems. – A case example for an intelligent home and for an intelligent office building.

Text Books:

- 1. Jim Sinopoli, 'Smart Buildings', Fairmont Press (March 8, 2007).
- 2. Barney Capehart,' Web Based Enterprise Energy and Building Automation Systems', C.E.M, Editor (March, 2007)
- Shengwei Wang, 'Intelligent buildings and building Automation', Routledge, (December, 2009).
- 4. Derek clements croome, 'Intelligent buildings : An introduction', Routledge, (November, 2012).

Course content and lecture schedule

S.No	Торіс	No of
		Lectures
1	Intoduction	
1.1	The emergence of the intelligent buildings,	2
	Introduction to the concept of intelligent buildings, The	
	need ,purpose and benefit of intelligent buildings	
1.2	History of Intelligent Buildings in India – Case	2
	examples	
2	Design of Intelligent buildings	
2.1	Control technologies: Time based & optimizer	1
	parameter based	
2.2	Choosing and installing a building management	1
	system. Components of building automation system	
2.3	Integration of Components of building automation	2
	system; HVAC, electrical, lighting, security, fire-	
	fighting, communication, CCTV interface, Energy	
	management system etc.	
3	Management of Intelligent buildings	
3.1	Building energy management	1
3.2	Trends and advances in energy management systems	2
3.3	Building management systems for retrofit, Shared	2
	tenant services.	
3.4	Performance Evaluation - Software	2

S.No Topic		No of
		Lectures
4	Networking	
4.1	Cable management	1
4.2	Fibre optic network design for intelligent buildings	2
4.3	Beyond the intelligent building - EDI (electronic data	2
	interchange) and telecommuting	
5	The future	
5.1	Intelligent design teams	1
5.2	Expert systems and intelligent building	1
5.3	The future of communities, buildings and building systems	2
6	Case studies	
6.1	A case example of an intelligent home and an	2
	intelligent office building.	
	TOTAL	26

Course compilers:

1.	AN. Elavezhiman	anearch@tce.edu
2.	P.Ananthalakshmi	anantha@tce.edu

Subject Code	Lectures	Tutorials	Practical	Credits
ARA103	-	-	32	16

ARA103 Architectural Thesis

0:16

Preamble:

The thesis studio gives students the opportunity to utilize knowledge and skills they have acquired during the previous design studios and to engage the interests and skills the student brought with them to the program in order to allow them to become an authority in their chosen area of study.

Programme Outcome addressed:

- a. Graduates will have been facilitated to design built environment through Practical application, Hands on training, Workshops which are integrated in the state of the art technologies and techniques relevant to the field to put students on par with the global trends.
- b. Graduate will demonstrate proficiency in creative, logical and lateral thinking processes, verbal and visual communication skills.
- c. Graduates will have been trained specifically catering to the complex array of multi-faceted technical input and knowledge base needed for the multi dimensional Architectural Profession.
- d. Graduates will have been exposed to issues such as relevance to the context, man, society, time and concern to the environment for designing built environments.
- e. Graduates will have acquired practical knowledge through exposure to the professional fields / industry/ existing built environment.
- f. Managerial skills and Professional values will have been consciously instilled to the graduates to develop entrepreneur abilities, social responsibility and clarity of purpose.
- g. Graduates will have been trained in different areas of interests through variety of specializations and will have been ensured continued enhancement of such interests while nurturing other avenues.

Competency:

- Design the built environment in which they employ critical and analytical skills to formulate and articulate an architectural idea and to develop a synthetic architectural proposal.
- 2. Explore, develop and demonstrate their approach to the design process and begin to define their practice.

 Develop the proficiency in handling of technical knowledge, ie. an understanding of structures, materials, and the implications of these for the architectural proposal.

Syllabus:

The main areas of study and research shall be Architecture, Urban design, Urban renewal and urban and rural settlements, Environmental Design, Conservation, Landscape Design, Housing etc. However, the specific thrust should be architectural design of built environment.

References:

- 1. Donald Appleyard, the Conservation of European Cities, M.I.T. Press, Massachusetts
- 2. Michelle Provoost et al., Dutchtown, NAI Publishers, Rotterdam, 1999
- 3. Richard Kintermann and Robert small site planning for cluster Housing van
- 4. Nastrand reinhold company, Jondon/New York 1977.
- 5. Miller T.G. Jr., Environmental Sciences, Wadsworth Publishing Co. (TB)
- 6. Kevin Lynch Site planning MIT Press, Cambridge, MA 1967.
- 7. Geoffrey and Susan Jellico, The Landscape of Man, Thames And Hudson, 1987.
- Arvind Krishnan & Others, Climate Responsive Architecture, a Design Handbook For Energy Efficient Buildings, TATA McGraw Hill Publishing Company Limited, New Delhi, 2001

Course Designers:

- 1. J. Jinu Louishidha Kitchley jinujoshua@tce.edu
- 2. R. Shanthi Priya rsparch@tce.edu