

NU/AC/AC-300621/8(B)/21-80

Date: 21.09.2021




NOTIFICATION

- Read:
1. **R-44 – Empowering the Academic Council to approve Teaching & Examination Scheme, Syllabi, etc published vide notification No. NU-442 dated 27.01.2004**
 2. **Notification No. NU-22 dated 24.07.2020 – Revision in TES and Syllabi of Semester-I of B.Arch. programme**
 3. **Resolution No. 3(B) – Faculty of Architecture & Planning meeting – 09.04.2021**
 4. **Resolution No. 8(B) – Academic Council meeting – 30.06.2021**

Sub: **Revision in the Teaching & Examination Scheme and Syllabi of Semester-I and II of B.Arch. programme in suppression of existing curricula**

It is hereby notified for information of all concerned that the Academic Council in its meeting held on 30.06.2021 under resolution No. 8(B) in exercise of powers conferred upon it by the Board of Governors under regulation mentioned at serial 1 above and taking into consideration the recommendations of the Faculty of Architecture & Planning, has resolved to approve the revision in the Teaching & Examination Scheme and Syllabi of Semester-I and II of **B.Arch.** programme in suppression of existing curricula in pursuance to the new guidelines of Council of Architecture published on 11.08.2020, to be made effective for the students to be admitted from academic year 2021-22 onwards as per **Appendix-A** attached herewith.


Executive Registrar

Encl.: Appendix-A [Pages: 1 to 50]

To,

1. Dean, Faculty of Architecture & Planning
2. Academic Coordinator
3. Dy. Registrar: Exam; IAP

Copy to,

1. Exam Sec.
2. OS
3. Library
4. P.A. to ER

c.f.w.cs to: Director General

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Year of introduction:	2021

INSTITUTE OF ARCHITECTURE and PLANNING NIRMA UNIVERSITY										
TEACHING AND EXAMINATION SCHEME FOR SEMESTER I - B.ARCH. A.Y.2021-22)										
Name of the Programme: Bachelor of Architecture										
SEMESTER I										
Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination			
		Hours/Week			Credit		SEE	Component Weightage		
		L	W	S				C	SEE	CE
2AR181	Architectural Design Studio - I	-	-	9	9	-	-	0.5	0.5	
2AR182	History & Theory - I: Sociology & Culture	2	-	-	2	3	0.5	0.5	-	
2AR183	Building Construction & Technology - I	2	2	-	4	3	0.3	0.5	0.2	
2AR184	Architectural Graphics Skills and Representation - I	-	4	-	4	-	-	0.5	0.5	
2AR185	Structure -I	1	2	-	3	-	-	0.5	0.5	
2AR186	Basic Design -I	-	4	-	4	-	-	0.5	0.5	
Total		5	12	9	26					
#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester VII and remaining 2 RSP up to Semester X.										
ELECTIVE COURSES										
No Elective will be offered in this semester										
SUPPLEMENTARY COURSES/ VALUE ADDED COURSES										
Course Code	Course Name	L	W	S	C	SEE	SEE	CE	LPW	
2ARS101	Visual Representation	-	2	-	-	-	-	-	1	
2ARS102	Yoga and Meditation	-	2	-	-	-	-	-	1	
\$ Credit of RSP will be given to those students who registers for RSP in the respective semester										
L: Lecture T: Tutorial P: Practical W: Workshop S: Studio C: Credit CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination										
Supplementary Courses:										
1. Visual Representation										
2. Yoga and Meditation										

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR181
Course Title:	Architectural Design Studio – I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	9	9

Course Learning Outcomes (CLO):

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

- Interpret basic vocabulary of design and architecture
- Identify and map human activity in space
- Develop an understanding of design as an iterative process
- Infer, represent and communicate design

Syllabus: 15 weeks (9 hours/week)

Total Teaching hours: 135 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introductory exercises based on ‘Learning by doing’ – <ul style="list-style-type: none"> • To develop representation and communication skills through exercises involving drawing, sketching, graphic language, model-making, collage, etc by the medium of exercises channelizing creativity 	45 hours
Unit-II	Introduction to studio-based iterative design process – To develop a small scale design project for comprehension of design criteria involving the following: <ul style="list-style-type: none"> • Exploring exercises that nurture the relationship and express the linkage between human activity and built-environment • Understanding human activity and behaviour in space by activity mapping, anthropometric studies, etc. • To make, explore, feel and mould space based on design ideas/principles • Undertake hands-on work and creative thinking. Explore ‘making’ through various mediums and techniques of representation • Introduction to visualization and representation of an architectural environment’s spatial qualities like spatial 	54 hours



enclosure, depth, height, view, orientation, etc and tectonic characteristics like surfaces, material, shape, texture, etc

- Unit-III Representation and communication of design. 36 hours
- Use of graphic language and representational techniques for communication of design
 - Introduction to the consensus of visualization skills and creative thinking for depiction of ideas and concepts

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/
References:

- 1) Tilley, A. R., & Henry Dreyfuss Associates. (2002). *The measure of man and woman: Human factors in design*. New York: Wiley.
- 2) Rowland, K. (1971). *Learning to see*. London: Ginn.
- 3) Rowland, K. (1969). *Educating the senses*. London: Ginn.
- 4) Rowland, K. (1964). *Looking and seeing*. Melbourne: Cheshire.
- 5) Rowland, K. (1981). *Pattern and shape*. Aylesbury: Ginn and Co.
- 6) Rowland, K. F. (1981). *The development of shape*. Aylesbury: Ginn.
- 7) Rowland, K. F. (1981). *The shapes we need*. Aylesbury: Ginn.
- 8) Thomas, R. K. (1969). *Three-dimensional design: A cellular approach*. New York: Van Nostrand-Reinhold Co.
- 9) Wong, W. (1972). *Principles of form and design*. New York: John Wiley & Sons, Inc.
- 10) Bates, K. F. (1979). *Basic design; principles and practice*. London: Barnes & Noble.
- 11) Karssen, A., & Otte, B. (2014). *Model making: Conceive, create and convince*. Amsterdam: Frame Publishers.
- 12) Brownell, B. E. (2017). *Transmaterial next: A catalog of materials that will redefine our future*. New York: Princeton Architectural Press.
- 13) Neufert, E., Neufert, P., & Kister, J. (2012). *Neufert*. Oxford: Wiley-Blackwell.
- 14) Ching, F. D. K., & Eckler, J. F. (2013). *Introduction to architecture*. Hoboken: Wiley.
- 15) Ching, F. D. K. (2007). *Architecture--form, space, and order*.
- 16) Jones, W. (2011). *Architects' sketchbooks*. London: Thames & Hudson.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR182
Course Title:	History & Theory - I: Sociology & Culture
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Review various cultural expressions and relation between culture and society
- Compare Indian history and its cultural values
- Develop an understanding of the relationship between people and place

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Culture and society – <ul style="list-style-type: none"> • What is culture and society • Elements of culture • Symbols and culture • Introduction to the symbolic and spatial manifestation of cultural expressions in built-environment 	10 hours
Unit-II	Indian culture – <ul style="list-style-type: none"> • History of India • Unity and diversity • Cultural values and identity • Understand the diversity of cultural expressions in Indian context 	8 hours
Unit-III	People and places <ul style="list-style-type: none"> • Culture and shelter (Indian context) • Culture, people and place – role of culture in place-making • Attribution of meanings in built-environment as an expression of cultural values 	12 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Jarzombek, M. (2013). Architecture of first societies: A global perspective. Hoboken, NJ: Wiley.
2. Stallabrass, Julian, and Julian Stallabrass. (2006) Print. Contemporary Art: A Very Short Introduction. Oxford: Oxford UP.
3. Giddens, Anthony. (1996) Print. Introduction to Sociology. New York: W.W. Norton.
4. Johnson, Harry Morton. (1960) Print. Sociology: A Systematic Introduction. New York: Harcourt, Brace.
5. Bronowski, Jacob. (1974) Print The Ascent of Man. Boston: Little, Brown.
6. Soergel, Philip M. (2005) Print. Arts & Humanities through the Eras. Detroit: Thomson Gale.
7. Pearce, F. G. (1965) Print. An Outline History of Civilization. Bombay: Oxford U.P.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR183
Course Title:	Building Construction & Technology - I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- Explain properties of building construction materials and their use in building construction.
- Give an outline of building construction systems and use of related building elements therein.
- Develop understanding of basics of building elements and building construction processes.

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction to Building Construction Materials – <ul style="list-style-type: none"> • Introduction to building construction materials and their classification based on their properties: ceramic, metals, composite, polymers and organic materials. • Relationship of material properties to techniques and processes of working with materials. 	12 hours
Unit-II	Introduction to elements of Super Structure and Sub - Structure – <ul style="list-style-type: none"> • Introduction to basic building elements and their role in a building: foundation, plinth, walls, opening, roof, floor etc. • Introduction to building construction system and its elements eg: - Load Bearing, Framed and Composite structures. • Explanation through case studies, measure drawing etc. 	16 hours
Unit-III	Introduction to masonry structures Understanding principles of Brick and Stone Masonry: <ul style="list-style-type: none"> • Composition of brick earth and their properties, manufacturing process of bricks, classification of bricks, test for bricks, special type of bricks, substitutes for bricks, etc. • Bonds, principles and applications in buildings. 	32 hours



- Brick walls in different bonds, ends, corners and junctions.
- Types of Masonry walls: load bearing, partition, cavity, jali, etc.
- Introduction to Mud and Stone construction and techniques of building with mud and stone.
- Demonstration of understanding by making models, drawings, hands-on work etc.

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/
References:

1. Kotadiya A. S. . Building Construction. : Mahajan Publishing, 2014
2. Agrawal, B. K.. Introduction to Engineering Materials. New Delhi: Tata McGraw Hill Education Ltd., 2013
3. Bhavikatti, S. S.. Materials of Construction Vol - 2. New Delhi: I. K. International Publishing House Pvt. Ltd., 2014
4. Ching, Francis D. K.. Visual Dictionary of Architecture. Delhi: Wiley India (P) Ltd., 2012
5. Ching, Francis D. K.. Building Structures Illustrated. New York: John Wiley & Sons, Inc., 2014
6. Ching, Francis D. K.. Building Construction Illustrated. Delhi: Wiley India (P) Ltd., 2012
7. Chudley, R.. Building Construction Handbook. Oxford: Butterworth-Heinemann Ltd., 2010
8. Gambhir, M. L.. Building Materials: Products, Properties and Systems. New Delhi: Tata McGraw Hill Education Private Limited, 2011
9. Kumar, Sushil. Building Construction. New Delhi: Standard Publishers Distributors, 2012
10. Lyons. Materials for Architects & builders. New York: Taylor & Francis, 2014
11. McKay, J. K.. Building Construction Vol - 2: Metric. Delhi: Pearson Education Asia Pte. Ltd., 2014
12. Mckay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
13. Onouye, Barry S.. Statics And Strength Of Materials For Architecture And Building Construction. Chennai: Pearson India Education Services Pvt Ltd., 2015
14. Patel, Nimish. Stone Buildings of Gujarat. Ahmedabad: CEPT University, 2010
15. Punmia, B. C. Building Construction. New Delhi: Laxmi Publications Pvt. Ltd., 2008
16. Rangwala, S. C.. Engineering Materials: Material Science. Anand: Charotar Publishing House, 2014
17. Singh, Gurcharan. Building Construction and Materials. Delhi: Standard Book House, 2012
18. Watson, Donald. Time saver Standards for Building Materials and Systems: Design Criteria and Selection Data. New Delhi: Tata McGraw Hill Education Private Limited, 2009

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR184
Course Title:	Architectural Graphic Skills & Representation– I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component			C
		LPW	PW	W	S
-	-	-	-	4	-
				4	4

Course Learning Outcomes (CLO):

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

- Make use of Orthographic Projection Drawing as a representation tool & medium of effective visual communication.
- Appraise skills of visualization
- Maximize the potential of two-dimensional drawing as tool of design development and representation.
- Develop skills related to Computer-aided design

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Geometrical Construction – <ul style="list-style-type: none"> • Constructing and dividing lines and angles • Constructing and dividing circles and arcs • Constructing Regular Polygons • Develop an understanding of 2D geometry by means of drafting 	10 hours
Unit-II	Orthographic Projection and Isometric views – <ul style="list-style-type: none"> • Drafting skills • Orthographic projection and auxiliary projection • Axonometric views, isometric views, and other views. • Projections of points, Lines and Planes • Projections of solids (Prisms & Pyramids) • Tilted Objects • Sections of Solids • Interpenetrations of Solids (Basic) 	30 hours
Unit-III	Development of Surfaces (D.O.S.) – <ul style="list-style-type: none"> • Introduction of D.O.S • Regular Polygons and Platonic Solids • D.O.S of hip roof & Gable roofs • D.O.S of sectioned objects 	10 hours



Unit-IV Allied Techniques –

- Develop skills in visualization softwares
- Learn about 3D representation of concepts and ideas through model-making

10 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Bhatt, N. D. (2014). *Engineering Drawing: Plane and Solid Geometry*. Anand: Charotar Publishing House Pvt.
2. Ching, F. D. (2015). *Architectural graphics*. Hoboken: John Wiley & Sons.
3. Ching, F. D., & Juroszek, S. P. (2018). *Design drawing*. Hoboken, NJ: John Wiley & Sons.
4. Chopra, A., Town, L., & Pichereau, C. (2013). *Introduction to Google Sketchup*. New York: Wiley.
5. Cooper, D. (2007). *Drawing and perceiving: Life drawing for students of architecture and design*. Hoboken: Wiley.
6. Donley, M., & Sonder, N. (2016). *SketchUp & LayOut for architecture: The step-by-step workflow of Nick Sonder*. Bristol, RI: Bizfound.
7. Helsel, J. D. (2007). *Engineering drawing and design*. Place of publication not identified: Glencoe Mcgraw-Hill Post.
8. Johnston, G. B. (2008). *Drafting culture: A social history of architectural graphic standards*. Cambridge, MA: MIT Press.
9. Torossian, A., & Brigham, G. B. (1937). *Architectural graphics; orthographic projection, the principal branch of descriptive geometry*. Ann Arbor, MI: Edwards letter shop.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR185
Course Title:	Structure I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Explain conceptual understanding of structural behavior
- Identify and relate to basic structural systems.
- Apply and identify technical vocabulary related to structural design.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Process of building structure – <ul style="list-style-type: none"> • Structure and Structural form • Significance of structure in Architecture • Identification of basic vocabulary pertaining to structures 	9 hours
Unit-II	Broad categorization of structural system – <ul style="list-style-type: none"> • Structural form - solid, Surface, skeleton, Membrane, hybrid • Structural form - in Nature • Structural form - man made 	9 hours
Unit-III	Broad categorization of structural system – <ul style="list-style-type: none"> • Tensile, compressive, shear, torsion, bending • Introduction to identifying stresses in structures 	9 hours
Unit-IV	Basic requirements of structure – <ul style="list-style-type: none"> • Structural material: strength, stiffness, shape • Equilibrium: Vertical, Horizontal, Rational • Settlement and earthquake behavior 	9 hours
Unit- V	Types of loads & supports – <ul style="list-style-type: none"> • Structural Elements: Strut, tie, beam, slab/plate, panel • Structural Element behavior: Tensile, compressive, shear, torsion, bending 	9 hours

Self Study:



Suggested List of
Experiments:
Suggested Case List:

Suggested Readings/
References:

1. James Ambrose, Building Structure, Canada Wiley, 2012
2. Millias, Malcolm, Building structures from concept to design, London, Spon Press, 2005
3. Ching, Francis D. K., Building Structures Illustrated, New York, John Wiley & Sons, Inc., 2014
4. Biggs, John M., Introduction to Structural Dynamics, New Delhi, McGraw Hill Education India Pvt Ltd, 2014
5. Sandaker, Bjorn N. Structural Basis of Architecture, UK, Taylor & Francis, 2011
6. Charleson, Andrew., Structure as architecture : Source book for architects and structural engineers, London, Taylor & Francis, 2015
7. Schodek, Daniel L., Structures, New Delhi, PHI Learning Private Limited, 2014
8. Ramamrutham, S., Theory of Structures, Delhi, Dhanpat Rai & Sons, 2013
9. Kumar, Ashok, Theory of Structures, New Delhi, Laxmi Publications Pvt. Ltd., 2004
10. Parikh, Janak, Understanding Concept of Structural Analysis and Design, Anand, Charotar Publishing House, 2000
11. Levy, Matthys, Why Buildings Fall Down: How Structures Fail, New York, W. W. Norton and Co., 2002
12. Salvadori, Mario. Structure in Architecture. Englewood Cliffs, NJ: Prentice-Hall, 1963.
13. Corkill, P. A., H. L. Puderbaugh, and H. K. Sawyers. Structure and Architectural Design. Iowa City: Sernoll, 1974.
14. Deplazes, and Söffker. Constructing Architecture: Materials, Processes, Structures. Basel: Birkhäuser Verlag, 2013.
15. Hunt, Tony. Tony Hunt's Structures Notebook. Oxford: Architectural, 2003.
16. Mainstone, R. J. Structure in Architecture: History, Design, and Innovation. Aldershot, Hampshire: Ashgate, 1999.
17. Muttoni, A. The Art of Structures: Introduction to the Functioning of Structures in Architecture. Abingdon, Oxford, UK: EPFL/Routledge, 2011.
18. Salvadori, Mario, Saralinda Hooker, and Christopher Ragus. Why Buildings Stand Up: The Strength of Architecture. New York: Norton, 1980.
19. Cowan, Henry J. Architectural Structures: An Introduction to Structural Mechanics. New York: Elsevier, 1976.
20. Gordon, J. E. The New Science of Strong Materials, Or, Why You Don't Fall through the Floor. Princeton, NJ: Princeton UP, 1984.
21. Anderson, Stanford, and Eladio Dieste. Eladio Dieste: Innovation in Structural Art. New York: Princeton Architectural, 2004.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR186
Course Title:	Basic Design – I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	4	-	4

Course Learning Outcomes (CLO):

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

- Interpret visual literacy and visual expression
- Interpret elements and principles of design
- Develop the basic skills & abilities to design
- Construct representation and cognitive skills
- Enhance and learn to channelize their creative thinking through constructing representation of their ideas/ concepts

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Representation skill development – <ul style="list-style-type: none"> • Sketching, 2D & 3D drawings, painting, graphic • Model making skills • Exploration of various materials for drawing and model-making • Visualization of concepts by appropriate medium 	12 hours
Unit-II	Cognitive skill development – <ul style="list-style-type: none"> • Observation, perception, registration and expression • Critical thinking and application of cognitive skills in design 	8 hours
Unit-III	Elements of design – <ul style="list-style-type: none"> • The visual components of color, form, line, shape, space, texture, and value • Concept representation using composition of elements of design 	8 hours
Unit-IV	Basic requirements of structure – <ul style="list-style-type: none"> • Structural material: strength, stiffness, shape • Equilibrium: Vertical, Horizontal, Rational • Settlement and earthquake behavior 	8 hours



- | | | |
|---------|---|----------|
| Unit- V | Abstraction and Simplification – | 16 hours |
| | <ul style="list-style-type: none"> • The design principles - Balance, emphasis, movement, proportion, rhythm, unity, and variety • Compositions using principles of design and understand design attributes | |
| Unit- V | Design vocabulary – | 8 hours |
| | <ul style="list-style-type: none"> • Simplification / abstraction of an object using basic principles and elements of design • Use of foreground- background / contrast / color | |

Self Study:
Suggested List of
Experiments:
Suggested Case
List:

Suggested
Readings/
References:

1. Ching, Francis D. K., and James Eckler. Introduction to Architecture. Print.
2. Ching, Francis D. K. Architectural Graphics. New York: Van Nostrand Reinhold, 1975. Print.
3. Ching, Francis D. K., and Steven P. Juroszek. Design Drawing. New York: Van Nostrand Reinhold, 1998. Print.
4. Ching, Francis D. K., Architecture: Form, Space, and Order. Hoboken, N.J: John Wiley & Sons, 2007. Print.
5. Aldo Tanchis and Huw Evans. Bruno Munari, Design as Art. Cambridge: MIT Press, 1987
6. Gombrich, E H. The Story of Art. New York: Phaidon Publishers; distributed by Oxford University Press, 1966
7. Berger, John. Ways of Seeing. New York, Viking Press, 1972
8. Lidwell, William; Kritina Holden; Jill Butler (2010). Universal Principles of Design (2nd ed.). Beverly, Massachusetts: Rockport Publishers. ISBN 978-1-59253-587-3.
9. White, Alex (2011). The Elements of Graphic Design. New York, NY: Allworth Press. pp. 81–105. ISBN 978-1- 58115-762-8.
10. Arthur L Guptill; Rendering with Pen and Ink; Watson-Guption Publications, 1997. ISBN 0823045293, 9780823045297
11. William Wilson Atkin; Architectural Presentation Techniques; Van Nostrand Reinhold Co., 1976. ISBN 0442203616, 9780442203610
12. Anja Hartmann; Unusual Architectural Presentation Drawings; Page One Publishers, 2007. ISBN 9812452141, 9789812452146
13. Frank Lohan; Pen and Ink Techniques; Contemporary books, 1978. ISBN 0486157686, 9780486137681
14. International library of Technology; Elements of Pen and Ink Rendering, Rendering with Pen and Brush,
15. BiblioBazaar, 2010. ISBN 1171598823, 9781171598824
16. Mike W Lin, Architectural Rendering Techniques: A Color Reference; John Wiley and Sons, 1985. ISBN 0471289396, 9780471289395
17. Tibor K Karsai, The Airbrush in Architectural Illustration; Van Nostrand Reinhold, 1989. ISBN 0442246900, 9780442246907
18. Arthur L Guptill, Drawing with Pen and Ink: And a word about the brush; Literary Licensing, LLLC, 2013.
19. Arthur L Guptill, Drawing and Sketching in Pencil; Courier Corporation 2012. ISBN 0486136485, 9780486136486

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARS101
Course Title:	Visual Representation
Course Type:	Value Added Course
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

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

- Develop the basic skills & abilities to visualize and sketch
- Comprehend the methods of developing different visual art forms
- Make use of different visual art type (i.e Drawing, Painting, Sketching, Print making, Collages, Montages, Sculpting etc) to communicate ideas

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Sketching skill development – <ul style="list-style-type: none"> • Sketching, 2D & 3D drawings, painting, graphic etc • Exploration of various materials and methods for sketching 	08 hours
Unit-II	Introduction to different types of visual arts – sketching, painting, making diagrams, collages, montages, print making, sculptures etc <ul style="list-style-type: none"> • Introduction of great artists and their methods • Understanding the relationship of visual art in architecture. Visualization and representation of an architectural environment's spatial qualities like spatial enclosure, depth, height, view, orientation, etc and tectonic characteristics like surfaces, material, shape, texture, etc 	08 hours
Unit-III	Make use of different visual art type to communicate ideas <ul style="list-style-type: none"> • Undertake hands-on work and creative thinking. Explore 'making' through various mediums and techniques of representation. 	14 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Ching, Francis D. K., and James Eckler. Introduction to Architecture. Print.
2. Ching, Francis D. K. Architectural Graphics. New York: Van Nostrand Reinhold, 1975. Print.
3. Ching, Francis D. K., and Steven P. Juroszek. Design Drawing. New York: Van Nostrand Reinhold, 1998. Print.
4. Ching, Francis D. K., Architecture: Form, Space, and Order. Hoboken, N.J: John Wiley & Sons, 2007. Print.
5. Aldo Tanchis and Huw Evans. Bruno Munari, Design as Art. Cambridge: MIT Press, 1987
6. Gombrich, E H. The Story of Art. New York: Phaidon Publishers; distributed by Oxford University Press, 1966
7. Berger, John. Ways of Seeing. New York, Viking Press, 1972
8. Arthur L Guptill; Rendering with Pen and Ink; Watson-Guptill Publications, 1997. ISBN 0823045293, 9780823045297
9. William Wilson Atkin; Architectural Presentation Techniques; Van Nostrand Reinhold Co., 1976. ISBN 0442203616, 9780442203610
10. Anja Hartmann; Unusual Architectural Presentation Drawings; Page One Publishers, 2007. ISBN 9812452141, 9789812452146
11. Frank Lohan; Pen and Ink Techniques; Contemporary books, 1978. ISBN 0486157686, 9780486137681
12. Mike W Lin, Architectural Rendering Techniques: A Color Reference; John Wiley and Sons, 1985. ISBN 0471289396, 9780471289395
13. Arthur L Guptill, Drawing with Pen and Ink: And a word about the brush; Literary Licensing, LLC, 2013.
14. Arthur L Guptill, Drawing and Sketching in Pencil; Courier Corporation 2012. ISBN 0486136485, 9780486136486

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARS102
Course Title:	Yoga and Meditation
Course Type:	Value Added Course
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

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

- To develop understanding of Yoga, its role in promoting healthful life and be able to perform Yoga Asanas
- To understand the benefits of Yoga and meditation for positive health, prevention of stress related health problems and rehabilitation.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching Hours
Unit-I	<ul style="list-style-type: none"> • Introduction to Yoga • Yoga Asanas • Benefits of Yoga Asanas - <i>Bandhas and Mudras</i> • Breath awareness 	20
Unit-II	<ul style="list-style-type: none"> • Definition & Importance of Health and routine – “<i>Dincharya</i>” and “<i>Ritucharya</i>” 	05
Unit-III	<ul style="list-style-type: none"> • Practices leading to Meditation: Breath Meditation, Om Meditation, Vipassana Meditation, etc 	05

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Year of introduction:	2021

INSTITUTE OF ARCHITECTURE and PLANNING NIRMA UNIVERSITY

TEACHING AND EXAMINATION SCHEME FOR SEMESTER I - B.ARCH. 2021-22)
Name of the Programme: Bachelor of Architecture
SEMESTER II

Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination		
		Hours/Week			Credit		SEE	Component Weightage	
		L	W	S				SEE	CE

CORE COURSES

2AR281	Architectural Design Studio - II	-	-	9	9	-	-	0.5	0.5
2AR282	History & Theory - II	2	-	-	2	3	0.5	0.5	-
2AR283	Building Construction & Technology - II	2	2	-	4	3	0.3	0.5	0.2
2AR284	Architectural Graphics Skills & Representation - II	-	4	-	4	-	-	0.5	0.5
2AR285	Structure - II	1	2	-	3	-	-	0.5	0.5
2AR286	Basic Design- II	-	4	-	4	-	-	0.5	0.5
2AR287	Surveying and Levelling	1	1	-	2	-	-	0.5	0.5
2AR288#	Related Study Programme -I #	-	-	-	3#	-	-	-	1
Total		6	13	9	28/ 31\$				

#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester VII and remaining 2 RSP up to Semester X.

No Elective will be offered in this semester

SUPPLEMENTARY COURSES/ VALUE ADDED COURSES

Course Code	Course Name	L	W	S	C	SEE	SEE	CE	LPW
2ARS201	Communication Skills	-	2	-	-	-	-	-	1
Yet to be decided	Value Added Courses*	-	2	-	-	-	-	-	1

\$ Credit of RSP will be given to those students who registers for RSP in the respective semester
*** Value Added courses offered in respective semester as offered by the Dean, FoAP,IAP,NU (As per attached Annexure-C)**

L: Lecture T: Tutorial P: Practical W: Workshop S: Studio C: Credit
CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination

Supplementary Courses:

1. Communication Skills
2. Value Added Course

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR281
Course Title:	Architectural Design Studio – II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	9	9

Course Learning Outcomes (CLO):

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

- Select using basic architectural design concepts, tools and methods.
- Interpret spatial organisation, structure, hierarchy and scale using architectural elements.
- Interpret design as an interpretive process and create design for a particular programme and context.

Syllabus: 15 weeks (9 hours/week)

Total Teaching hours: 135 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Design exercises based on 'Learning by doing' – To have a short introductory exercise to: <ul style="list-style-type: none"> • Understanding Natural and man-made place • Human activity and behaviour in Space • Exploration of spatial qualities like spatial enclosure, depth, volume, view, orientation, etc and tectonic characteristics like form, surfaces, material, shape, texture, etc • Nature of concepts, ideas and design principles 	32 hours
Unit-II	Introduction to studio-based iterative design process – <ul style="list-style-type: none"> • To develop a design project with specific site and programme of residential or institutional nature. • Introduction to the process of establishing relationship of built-form with context • Introduction to requirements of the project like built-up area, utility, activity pattern, open space, etc • Introduction to site parameters like landscape, ground morphology, site climate, orientation, etc • Integrate learning from programmatic and site analysis • Introduction to processes of conceptualization, ideation, diagramming, etc • Engage in space making exercises/activities using architectural elements. Explore relationship of part to the whole and whole to the part. 	47 hours



- Explore relationship between space, order, tectonics, site, use and concept to create a meaningful experience of Architectural space.
 - Undertake appropriate exercises/activities to visualize and represent design learning.
- Unit-III Design Resolution with Synthesis of design parameters –
- Develop understanding of hierarchy of spaces, nature of architectural spaces and quality of spatial enclosures, etc 28 hours
 - Develop an understanding to translate the principles to design to spatial expression
 - Achieve synthesis of design criteria and parameters like spatial quality, form, function, response to site, etc
 - Develop architectural language using architectural elements
- Representation and communication of design –
- Use of appropriate graphic and technical representational skills to communicate architectural design comprehensively 28 hours
 - Communication of design concepts and ideas by appropriate representation skills

Self Study:
Suggested
List of
Experiments:
Suggested
Case List:
Suggested
Readings/
References:

- 1) Agkathidis, A. (2016). *Generative Design: Form-finding techniques in architecture*. London: Laurence King Publishing
- 2) Agkathidis, A. (2012). *Modular structures in design and architecture*. Amsterdam: BIS Publishers
- 3) Agkathidis, A. (2017). *Biomorphic structures*. London: Laurence King.
- 4) Jormakka, K., Schürer, O., & Kuhlmann, D. (2014). *Design methods*. Basel: Birkhäuser.
- 5) Kim, S., & Pyo, M. (2012). *Mobile architecture*. Berlin: DOM.
- 6) Tilley, A. R., & Henry Dreyfuss Associates. (2002). *The measure of man and woman: Human factors in design*. New York: Wiley.
- 7) Arnheim, R. (2015). *Visual thinking*. Berkeley : University of California Press.
- 8) Tait, J. (2018). *The architecture concept book*. London : Thames & Hudson.
- 9) Karssen, A., & Otte, B. (2014). *Model making: Conceive, create and convince*. Amsterdam: Frame Publishers.
- 10) Brownell, B. E. (2017). *Transmaterial next: A catalog of materials that will redefine our future*. New York : Princeton Architectural Press.
- 11) Adrover, E. R. (2015). *Deployable structures*. London: Laurence King Publishing.
- 12) Neufert, E., Neufert, P., & Kister, J. (2012). *Neufert*. Oxford: Wiley-Blackwell.
- 13) Ching, F. D. K., & Eckler, J. F. (2013). *Introduction to architecture*. Hoboken: Wiley.
- 14) Pause, M., & Clark, R. H. (2013). *Precedents in architecture: Analytic diagrams, formative ideas, and partis*. Hoboken, N.J: Wiley.
- 15) Ching, F. D. K. (2007). *Architecture--form, space, and order*.

- 16) Jones, W. (2011). *Architects' sketchbooks*. London: Thames & Hudson.
- 17) Pandya, Y., & Vastu-Shilpa Foundation for Studies and Research in Environmental Design. (2003). *Elements of space making*. Ahmedabad: Vastu-Shilpa Foundation for Studies and Research in Environmental Design.
- 18) Unwin, S. (2010). *Twenty buildings every architect should understand*. London: Routledge

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR282
Course Title:	History and Theory - II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Illustrate the geography of building materials / resources/ construction
- Examine the creation of different cultures and the impact of other factors on their architecture
- Interpret the impact of factors that shape architecture within a culture
- Discuss methods for understanding sociological background – Degree of dominance of religious / political / economical class

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Prehistoric architecture – <ul style="list-style-type: none"> • Introduction to early and prehistoric architecture • Logical and structural transformation of building system 	4 hours
Unit-II	Early civilizations (Mesopotamian, Egyptian, Indus, Chinese, Minoan, Mycenaean, Pre-Columbian Americans etc.) – <ul style="list-style-type: none"> • Introduction to early civilizations, their societies, culture, material, structural and technological features leading towards the progress of their architecture 	10 hours
Unit-III	Greek architecture – <ul style="list-style-type: none"> • Architecture understood in terms of material, belief and social systems. • Exposure to systems of proportion and scaling 	8 hours

Unit-IV Roman Architecture –

- Architecture as a realisation of the ideals of the society. The development of architecture through different phases of the roman empire and its decline. The influence of such architecture on later times.

8 hours

Self Study:

Suggested List of
Experiments:
Suggested Case List:

Suggested Readings/
References:

1. Fletcher, Banister. Sir Banister Fletcher's A History of Architecture. London: Butterworths, 1987. Print.
2. Kostof, Spiro. A History of Architecture: Settings and Rituals. New York: Oxford UP, 1985. Print.
3. Brown, Percy. Indian Architecture. Bombay: Taraporevala's Treasure House of. Print.
4. Tadgell, Christopher. A History of Architecture. London: Ellipsis, 2000. Print.
5. Tadgell, Christopher. The History of Architecture in India: From the Dawn of Civilization to the End of the Raj. Print.
6. Ching, Francis D. K., Mark Jarzombek, and Vikramaditya Prakash., A Global History of Architecture. Hoboken, NJ: J. Wiley & Sons, 2007. Print.
7. Havell, Ernest Binfield., Encyclopedia of Architecture in the Indian Subcontinent. New Delhi: Aryan International, 2004. Print.
8. Albanese, Marilia., Architecture in India. New Delhi: Om Book Service, 2000. Print.
9. Grover, Satish., The Architecture of India: Islamic (727-1707 A.D.). New Delhi: Vikas Pub. House, 1981. Print.
10. Kramrisch, Stella, and Raymond Burnier., The Hindu Temple. Delhi: Motilal Banarsidass, 1976. Print.
11. Volwahren, Andreas., Living Architecture: Indian. New York: Grosset & Dunlap, 1969. Print.
12. Sandström, Gösta E., Man, the Builder. New York: McGraw-Hill, 1970. Print.
13. Maisels, Charles Keith; The Emergence of civilization, 1990
14. History of World Architecture. London: Faber, 1979. Print.
15. Lloyd, Seton, and Hans Wolfgang Müller., Ancient Architecture: History of World Architecture. Milan: Elect architecture, 2004. Print.
16. Norberg-Schulz, Christian, and Pier Luigi Nervi. History of World Architecture. New York: Abrams, 1971. Print.
17. Bagenal, Philip. The Illustrated Atlas of the World's Great Buildings: A History of World Architecture . S.1. Leisure, 1980. Print.
18. Fazio, Michael W., Marian Moffett, Lawrence Wodehouse, and Marian Moffett. A World History of Architecture. Boston: McGraw-Hill, 2008. Print.
19. Michell, George, and Philip Davies. The Penguin Guide to the Monuments of India. London, England: Viking, 1989. Print.
20. Cotterell, Arthur (ed.); The Penguin encyclopedia of ancient civilizations, 1980

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR283
Course Title:	Building Construction & Technology – II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- Demonstrate an understanding of basic principles for planning, design and construction of load-bearing system of construction.
- Explain construction of building elements based on material-behavior and its relation to other element.
- Illustrate an understanding and explaining the basic principles of building sub-structure.

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Load bearing construction system – <ul style="list-style-type: none"> • Understanding building elements (From foundations to parapet) using simple manufactured materials and simple constructional systems. • Understanding elements of load bearing system like foundations, walls, openings, lintels, columns, piers etc and their role in a load bearing system. 	16 hours
Unit-II	Foundations : Shallow and Deep – Understand basic principles of foundation design: <ul style="list-style-type: none"> • Definitions, general requirements, safe bearing capacity of different types of soils, material and foundation type, etc • Shallow foundation: Strip, Isolated, combined and raft foundations and their construction techniques. • Introduction to Deep foundation: Grillage foundations, Piles foundations, Caisson foundations, etc. 	16 hours
Unit-III	Building Materials and properties – <ul style="list-style-type: none"> • Understanding of behavior of elements in a construction system, in relation to the material properties: <ul style="list-style-type: none"> ○ Lime: Sources of lime, classification and manufacturing process of lime, properties and use, tests on lime, etc. ○ Cement: Composition of ordinary cement, function of cement ingredients, properties of cement – soundness, 	16 hours



setting time, strength, etc. Grade of cement and different types of cement used in construction. Manufacturing process of ordinary cement in dry and wet method, packing and storage of cement, use of cement.

- **Mortar:** Sand, sources of sand and its classification, tests on sand, classification of mortar – lime mortar, mud mortar, surkhi mortar, cement mortar, preparation of mortar and its properties, use and selection of mortar for different construction work, etc.
- **Timber :** Varieties of timber, defects in timber, decay of timber, qualities of timber, seasoning, storage and preservation, properties and uses.

Unit-IV Carpentry Joinery Details –

- Behavior of wood, wood-working and tools.
 - Types and application of timber joinery
- Appropriate joinery for different loading conditions

12 hours

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/
References:

1. Agrawal, B. K.. Introduction to Engineering Materials. New Delhi: Tata McGraw Hill Education Ltd., 2013
2. Barry, R. Construction of Buildings Vol - 4: Multi-Storey Buildings, Foundation and Substructures, Structural Steel Frames, External Walls and Cladding of Framed Buildings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
3. Barry, R.. Construction of Buildings Vol - 1: Foundations and Oversite Concrete, Walls, Floors, Roofs. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
4. Beylerian, George M.. Material Connexion: The Global Resource Of New And Innovative Materials For Architects, Artists And Designers.. UK: Thames & Hudson Ltd, 2005
5. Bhavikatti, S. S.. Materials of Construction Vol - 2. New Delhi: I. K. International Publishing House Pvt. Ltd., 2014
6. Bhavikatti, S. S.. Building Construction. Noida: Vikas Publishing House Pvt. Ltd., 2013
7. Ching, Francis D. K.. Visual Dictionary of Architecture. Delhi: Wiley India (P) Ltd., 2012
8. Ching, Francis D. K.. Building Structures Illustrated. New York: John Wiley & Sons, Inc., 2014
9. Ching, Francis D. K.. Building Construction Illustrated. Delhi: Wiley India (P) Ltd., 2012
10. Chudley, R.. Building Construction Handbook. Oxford: Butterworth-Heinemann Ltd., 2010
11. Duggal, S. K.. Building Materials. New Delhi: New Age International (P) Limited, 2012
12. Ford, Edward R. Details of modern architecture, Vol. 2: 1928 to 1988. London: Mit Press, 2003

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14. Kumar, Sushil. Building Construction. New Delhi: Standard Publishers Distributors, 2012
15. Lyons. Materials for Architects & builders. New York: Taylor & Francis, 2014
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17. McKay, J. K.. Building Construction Vol - 3: Metric. Delhi: Pearson Education Pte. Ltd., 2013
18. McKay, J. K.. Building Construction Vol - 4: Metric. Delhi: Pearson Education Pte. Ltd., 2013
19. McKay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
20. Patel, Nimish. Stone Buildings of Gujarat. Ahmedabad: CEPT University, 2010
21. Pramari, V. S.. Wood Carvings of Gujarat. India: Publications Division Govt. of India, 2001
22. Punmia, B. C.. Building Construction. New Delhi: Laxmi Publications Pvt. Ltd., 2008
23. Rangwala, S. C.. Building Construction. Anand: Charotar Publishing House, 2014
24. Rangwala, S. C.. Engineering Materials: Material Science. Anand: Charotar Publishing House, 2014
25. Salgado, Rodrigo. Engineering of Foundation. New Delhi: Tata McGraw Hill Education Ltd., 2011
26. Salvadori, Mario. Why Buildings Stand Up: The Strength of Architecture. New York: W. W. Norton and Co., 1980
27. Schodek, Daniel L.. Structures. New Delhi: PHI Learning Private Limited, 2014
28. Shah, M. G.; Padki, S. Y. ; Kale, C. M.. Building Construction Vol - 4: Metric. New Delhi: Tata McGraw Hill Education Ltd., 2015
29. Singh, Gurcharan. Building Construction and Materials. Delhi: Standard Book House, 2012
30. Soni, Saurabh Kumar. Building Materials and Construction. New Delhi: S. K. Kataria & Sons, 2013

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR284
Course Title:	Architectural Graphic Skills & Representation– II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	4	-	4

Course Learning Outcomes (CLO):

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

- Learn various techniques to represent an idea 3-dimensionally making use of the concept of sciography and perspective.
- Maximize the skills of visualization
- Utilize visualalzaion skills to represent basic form and space

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Sciography – <ul style="list-style-type: none"> • On Flat Surfaces (horizontal, vertical and inclined surfaces) • On Curved Surfaces • Sciography of Architectural Elements (Walls, Steps, Roof etc..) 	20 hours
Unit-II	Perspective – <ul style="list-style-type: none"> • Perspective drawing as representation tool • Different Types of Perspective Drawings and it's applications – One Point Perspective and Two Point Perspective • Perspective Views of forms and Spaces 	20 hours
Unit-III	Allied Techniques – <ul style="list-style-type: none"> • Skills in visualization softwares • Develop and illlustrate 3D representation of concepts and ideas through model-making • 3D visualization 	20 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Bennett, W. I. (1931). *Architectural graphics. Elements of descriptive geometry, shades and shadows, perspective*. Ann Arbor, MI: G. Wahr.
2. Bhatt, N. D. (2014). *Engineering Drawing: Plane and Solid Geometry*. Anand: Charotar Publishing House Pvt.
3. Ching, F. D. (2015). *Architectural graphics*. Hoboken: John Wiley & Sons.
4. Ching, F. D., & Juroszek, S. P. (2018). *Design drawing*. Hoboken, NJ: John Wiley & Sons.
5. Chopra, A., Town, L., & Pichereau, C. (2013). *Introduction to Google Sketchup*. New York: Wiley.
6. Cooper, D. (2007). *Drawing and perceiving: Life drawing for students of architecture and design*. Hoboken: Wiley.
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9. Metzger, P. W. (2007). *The Art of Perspective: The Ultimate Guide for Artists in Every Medium*. North Light Books.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR285
Course Title:	Structure II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Explain and interpret structural behavior of materials.
- Built about basic structural systems
- Develop vocabulary on structural systems
- Make use of load mechanism in structural systems

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Methods of categorization of structural system – <ul style="list-style-type: none"> • Vocabulary of structural systems • Structure types • Solid - wall, arch, vault etc. • Surface - Grid, plates, shells, stressed skin • Skeleton - truss and frameworks • Membrane - Cable/membrane tents, cable nets, pneumatics • Hybrids - Tension-assisted structures 	18 hours
Unit-II	Mechanical properties of structural material – <ul style="list-style-type: none"> • strength, stiffness, shape • Tensile, compressive, shear, torsion, bending • dead load, imposed load, thermal load, Dynamic load 	15 hours
Unit-III	Structural systems based on mechanism of transfer of load – <ul style="list-style-type: none"> • Strut, tie, beam, slab/plate, panel • Vertical, Horizontal, Rational • settlement and earthquake behavior • Tensile, compressive, shear, torsion, bending 	12 hours

Self Study:
Suggested List of
Experiments:



Suggested Case
List:
Suggested
Readings/
References:

1. James Ambrose, Building Structure, Canada Wiley, 2012
2. Millias, Malcolm, Building structures from concept to design, London, Spon Press, 2005
3. Ching, Francis D. K., Building Structures Illustrated, New York, John Wiley & Sons, Inc., 2014
4. Kara, Hanif. Design Engineering: AKT Adams Kara Taylor. Barcelona: Actar, 2008.
5. Biggs, John M., Introduction to Structural Dynamics, New Delhi, McGraw Hill Education India Pvt Ltd, 2014
6. Onouye, Barry S., Statics And Strength Of Materials For Architecture And Building Construction, Chennai, Pearson India Education Services Pvt Ltd., 2015
7. Charleson, Andrew., Structure as architecture : Source book for architects and structural engineers, London, Taylor & Francis, 2015
8. Parikh, Janak, Understanding Concept of Structural Analysis and Design, Anand, Charotar Publishing House, 2000
9. Seward, Derek, Understanding structures: analysis materials design, London, Palgrave, 2014
10. Schodek, Daniel L. Structures. Englewood Cliffs, NJ: Prentice-Hall, 1980. Print.
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20. Anderson, Stanford, and Eladio Dieste. Eladio Dieste: Innovation in Structural Art. New York: Princeton Architectural, 2004. Print.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR286
Course Title:	Basic Design – II
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	4	-	4

Course Learning Outcomes (CLO):

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

- Demonstrate basic design to architectural design and design field in general
- Illustrate complex observations, design and expressional skills
- Make use of advanced representation and analytical skills
- Enhance and learn to channelize their creative thinking through constructing representation of their ideas/ concepts

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Lateral Thinking – <ul style="list-style-type: none"> • Brainstorming • Mental Associations - Role of experience and memory in design • Matric of ideas 	8 hours
Unit-II	Skill development – <ul style="list-style-type: none"> • 3D Exploration • Complex geometrical form • Expression of Graphics, geometry, solids, assembly & intersections • Exploration of material and advanced presentation techniques • Descriptive and analytical skills • Visualization of concepts by appropriate medium 	8 hours
Unit-III	Abstraction and transformation – <ul style="list-style-type: none"> • Complex observations, perception, design and expression • Concept representation using composition of elements of design • Progressive evolution 	20 hours

Unit-IV Volumetric & Spatial exploration –

24 hours

- Understanding of scale and proportion
- Spatial perception
- Volumetric exploration
- Ordering principles
- Spatial vocabulary
- Relation of basic design to architectural design

Self Study:

Suggested List of Experiments:

Suggested Case List:

- Suggested Readings/ References:
1. Ching, Francis D. K., and James Eckler. Introduction to Architecture. Print.
 2. Ching, Francis D. K. Architectural Graphics. New York: Van Nostrand Reinhold, 1975. Print.
 3. Ching, Francis D. K., and Steven P. Juroszek. Design Drawing. New York: Van Nostrand Reinhold, 1998. Print.
 4. Ching, Francis D. K., Architecture: Form, Space, and Order. Hoboken, N.J: John Wiley & Sons, 2007. Print.
 5. Aldo Tanchis and Huw Evans. Bruno Munari, Design as Art. Cambridge: MIT Press, 1987
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 7. Berger, John. Ways of Seeing. New York, Viking Press, 1972
 8. Lidwell, William; Kritina Holden; Jill Butler (2010). Universal Principles of Design (2nd ed.). Beverly, Massachusetts: Rockport Publishers. ISBN 978-1-59253-587-3.
 9. White, Alex (2011). The Elements of Graphic Design. New York, NY: Allworth Press. pp. 81–105. ISBN 978-1- 58115-762-8.
 10. Arthur L Guptill; Rendering with Pen and Ink; Watson-Guption Publications, 1997. ISBN 0823045293, 9780823045297
 11. William Wilson Atkin; Architectural Presentation Techniques; Van Nostrand Reinhold Co., 1976. ISBN 0442203616, 9780442203610
 12. Anja Hartmann; Unusual Architectural Presentation Drawings; Page One Publishers, 2007. ISBN 9812452141, 9789812452146
 13. Frank Lohan; Pen and Ink Techniques; Contemporary books, 1978. ISBN 0486157686, 9780486137681
 14. International library of Technology; Elements of Pen and Ink Rendering, Rendering with Pen and Brush,
 15. BiblioBazaar, 2010. ISBN 1171598823, 9781171598824
 16. Mike W Lin, Architectural Rendering Techniques: A Color Reference; John Wiley and Sons, 1985. ISBN 0471289396, 9780471289395
 17. Tibor K Karsai, The Airbrush in Architectural Illustration; Van Nostrand Reinhold, 1989. ISBN 0442246900, 9780442246907
 18. Arthur L Guptill, Drawing with Pen and Ink: And a word about the brush; Literary Licensing, LLLC, 2013.
 19. Arthur L Guptill, Drawing and Sketching in Pencil; Courier Corporation 2012. ISBN 0486136485, 9780486136486

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR287
Course Title:	Surveying & Levelling
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	1	-	2

Course Learning Outcomes (CLO):

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

- Interpret the concept, instruments and methods of surveying
- Make use and explain of concepts and methods of surveying
- Appraise the relevance of surveying and leveling with Architectural field

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction of surveying – <ul style="list-style-type: none"> • Surveying and Architecture • Introduction to surveying: Definition, object, uses, classification of survey, • Formulae used in measurement of land with geometrical and abstract configurations to work out Areas, volumes and other quantities. • Principles of surveying, scales and types of scale, Accuracy • Errors: Types, definitions, laws of errors, weights, theory of least squares, distribution of errors. 	3 hours
Unit-II	Linear Measurements – <ul style="list-style-type: none"> • Measurement of distance with chain, tape, EDM etc., measurement on sloping ground, obstacles, Errors in measurements • Selection of survey station. • Chain line, Offset, oblique offset, tie line, check lines, ranging. • Field book plotting. 	3 hours
Unit-III	Measurements of Angles – <ul style="list-style-type: none"> • Various parts of Compass, Types, • Errors affecting angular measurements • Types of traverse, Orientation of traverse surveys • Theodolite Traversing: Types of Theodolites, Definitions, temporary adjustment of theodolite 	3 hours

Unit-IV	Leveling – <ul style="list-style-type: none"> • Definitions, Types of levels, methods of leveling • Various parts of dumpy level. • Leveling staff, technical terms used in leveling. • Contouring: Definition, Characteristics of contour, plotting using radial line & square grids 	3 hours
Unit-V	Plane table surveying – <ul style="list-style-type: none"> • Introduction. • Equipment required. • Working with plain table. • Errors in plane table. • Advantage and disadvantage. 	3 hours
Unit-VI	Curve Setting – <ul style="list-style-type: none"> • Introduction. • Types of Curves • Elements of Curves • Methods of Curve Setting 	3 hours
Unit-VII	Construction surveying – <ul style="list-style-type: none"> • Introduction. • Equipment for setting out. • Horizontal and vertical control. • Setting out a building and structure (complete layout). 	6 hours
Unit-VIII	Advanced Surveying – <ul style="list-style-type: none"> • Total Station • GPS • Photogrammetry • Remote Sensing • Other Advanced Methods 	6 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Chandra A.M.(2006). Plane Surveying (2nd ed.). New Delhi, India: New Age International Publishers
2. Ghosh J.K.. (2010). Elementary Engineering Surveying. New Delhi, India: Stadium Press (India) Pvt.Ltd.
3. Punamia B.C. (2016). Surveying Volume 1 (17th ed.). Bengaluru, India: Laxmi Publications(P) Ltd.
4. Gopi Satheesh., Sathi Kumar R., Madhu, N. (2018). Advanced Surveying (2nd ed.). Noida, India. Pearson
5. Rangwala (2018). Surveying and Leveling. Anand, India: Charotar
6. Joseph G., (2005). Fundamentals of Remote Sensing. (2nd ed.), Hyderabad, India : Universities Press Pvt.Ltd.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR288
Course Title:	Related Study Programme (RSP)-I
Course Type:	Core
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	3

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 weeks (30 hours / week)

Total Teaching hours: 90 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals – <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	Compilation and documentation – <ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	30 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARS201
Course Title:	Communication Skills
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Demonstrate understandings of English Language
- Interpret the basic structure, grammar, vocabulary, speech construction
- Develop understanding and make use of architectural vocabulary
- Build art of presentation in basic writing and public speaking with focus on meaning, interpretation, accent, rhythm, etc. of the keywords in Architecture.
- Adapt skills of listening, reading, understanding, speaking, writing & translation in English

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Introduction to Communication <ul style="list-style-type: none"> • What is communication? • Types of communication • Why is it important? 	2 hours
Unit – II	Basic components of Communication <ul style="list-style-type: none"> • Non-verbal communication • Body language exercises • Gestures • Reading non-verbal cues • Vocabulary development 	4 hours
Unit – III	Reading Skills <ul style="list-style-type: none"> • Understanding SQRR technique with the aid of literary texts • Note taking • Outlining and summarizing • Vocabulary development 	4 hours

Unit – IV	Listening Skills	4 hours
	<ul style="list-style-type: none"> • Concentration to improve listening • Courteous and Responsive Listening • Practice listening through literary texts • Follow-up discussions • Vocabulary development 	
Unit – V	Grammar Review and Reinforcement	4 hours
	<ul style="list-style-type: none"> • Grammar categories • English word order (SVO) • Writing exercise through literary texts* • Common grammatical error analysis • Vocabulary development** 	
Unit – VI	Vocabulary development reinforcement	4 hours
	<ul style="list-style-type: none"> • Homonyms, homographs, homophones, heteronyms, elisions etc. • Introduction to Architectural Keywords • Meanings to Architectural Keywords • Making Sense of Architectural Keywords through the Masters' Works 	
Unit – VII	Effective Writing Skills	6 hours
	<ul style="list-style-type: none"> • Note taking • Outlining and summarizing • Drafting a paragraph and essay • Writing with a descriptive focus, a personal narrative, an expository focus, business letter, etc. 	
Unit – VIII	Oral Presentation	2 hours
	<ul style="list-style-type: none"> • Impromptu speeches • Group Discussions • Assignment based interaction*** • Vocabulary development • Planning, Developing and Delivering speech 	

- *vocabulary list will be based on the key words in Architecture.
- **Reading of literary texts and writing exercises based on the “Masters” in the field of architecture, their biographies and philosophies.
- Assignments will be based on interviews/interactions with different architects.

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/
References:

1. Babette K. Lemon. Reading, Writing, and Speaking. *The School Review* 1941 49:7, 554-555
2. Alfonso Caramazza. *Issues in Reading, Writing and Speaking: A Neuropsychological Perspective*. Kluwer Academic Pub., 1991.
3. Simon. S. Montefiore. *Speeches that changed the world*. Quercus.
4. Jones, Leo. *Working in English: Teacher's Book*. Cambridge: Cambridge University Press, 2003.
5. Taylor, Grant. *English Conversation Practice*. New York: McGraw-Hill, 1967. Print.
6. Mudambadithaya G. S., *Communicative English for Professional Courses*
7. *Communication Skills for Technical students*, CDC, TTTI, Bhopal, Somiya Publications Pvt. Ltd. 4th revised Edition, July, 1995
8. Hornby, A.S., *Advanced Learner's Dictionary of current English* Geoffrey Leech and Jan Svartivik, *Communicative grammar of English*, ELBS.

NIRMA UNIVERSITY

Annexure-C

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Year of introduction:	2021

Value Added Courses *	
2ARV01	Installation Design and Execution
2ARV02	Appropriate & emerging material & technology in construction
2ARV03	Portfolio Making
2ARV04	Performing Arts (Dance, Drama, Music)
2ARV05	Representation Skill development
2ARV06	Visualization Skills
2ARV07	Movie Making
2ARV08	Soft Skills for Professionals
2ARV09	Art in Architecture
2ARV10	Graphic and Product Design



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV01
Course Title:	Installation Design and Execution
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

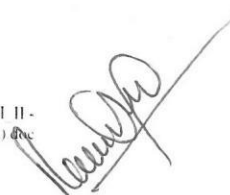
During the course, students will be able to -

- Apply knowledge of Design and Construction for preparing Site-specific Installations from materials such as Metal, Bamboo, Wood, etc.
- Do market survey of materials, estimation and costing of installations.
- Work as a team and mobilise man-power for doing site specific works.
- Undertake entire process of Installation Design from idea generation to execution.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	<p>Basics of Installation Design –</p> <ul style="list-style-type: none"> • Study of space, site, location, situation, immersive experience, viewer relations, and exhibition design. • Exploration of relationship between the work of art and the environment in which it is installed. • Researching new processes and methods of making and construction. 	6 hours
Unit – II	<p>Sculptural and structural installations –</p> <ul style="list-style-type: none"> • Understanding of metals and techniques to work with metals like welding, bending, drilling, clamping, etc • Understanding of Bamboo, Wood, Cane and techniques of working like sawing, planing, polishing, jointing, etc • Working with materials like Plastics, Paper, Rope, Fabric, etc • Understanding and managing installation processes, priorities and schedules of workspace. • Market survey of materials, estimation and costing of installations. • Hands-on working with materials and knowledge of working with tools. • Implement knowledge of building construction and technology for installation process, durability and stability of Installations. 	10 hours



Unit – III **Graphic Design and Art Installations –**

14 hours

- Different types of collages and montages
- Collages and Montages as tool to represent ideas
- Effect of colour and graphic on space and people
- Colour Theory and meaningful use of colour
- Knowledge of Surface finishes - paint, coating, patina, polish, etc

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV02
Course Title:	Appropriate & emerging material & technology in construction
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Various emerging construction technology and their application in building?
- Appropriate materials and technology in various context (Climate, geography, location etc.)
- Design and Practical work - Hands on construction of building elements using appropriate materials and various construction methods

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Emerging and appropriate Material – <ul style="list-style-type: none"> • Explore various building materials appropriate for the context and method of building • Explore various vernacular techniques of building and establish the relation to current times 	5 hours
Unit – II	Design – <ul style="list-style-type: none"> • Design an element using various materials and construction methods • Work out the joinery and details, prepare models 	5 hours
Unit – III	Hand on work – <ul style="list-style-type: none"> • Build the element designed • Learn the technique of building various components of a building 	20 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV03
Course Title:	Portfolio making
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Explore different softwares required to clean, organise and compile architectural academic work
- Compile architectural academic work in a form of Architectural Portfolio
- Understand different digital printing methods required to make hardcopy of Architectural Portfolio.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Organising and Cleaning Data – <ul style="list-style-type: none"> • Explore various methods of organising and cleaning different architectural works i.e drawing, sketches, model etc • Photoshop (or equivalent) tools and tutorials 	5 hours
Unit – II	Layout and Formatting – <ul style="list-style-type: none"> • Various layouts for architectural portfolio and their significance • Illustrator (or equivalent) tools and tutorial • Indesign (or equivalent) tools and tutorial 	15 hours
Unit – III	Printing – <ul style="list-style-type: none"> • CMYK and RGB color profile • Control over file size • Digital printing methods and paper qualities • Various binding methods 	10 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV04
Course Title:	Performing Arts (Dance, Drama, Music)
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Explore and appreciate various fields of performing arts
- Understand the basic elements of dance, drama and music
- Practically work on dance/music/drama performance

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Dance – <ul style="list-style-type: none"> • Explore and communicate ideas, feelings and thoughts • The basic elements of dance: actions, dynamics, space, relationships, choreographic devices, introduction to contact, performance skills, choreographic skills and appreciation skills 	10 hours
Unit – II	Drama – <ul style="list-style-type: none"> • Explore a theme/topic/issue • Basic elements of drama and its vocabulary • Write reviews and develop an interesting script 	10 hours
Unit – III	Music & Poetry – <ul style="list-style-type: none"> • Basic elements of music • Use different forms of music • Practical skills - new computer technology and keyboards, and will be encouraged to take part in group performances, both vocal and instrumental • Poetry writing and narration 	10 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV05
Course Title:	Representation Skill development
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Develop better rendering skills, make technically correct and presentable rendered drawings that help in communicating their ideas or drawings better
- Develop better model-making skills, make precise, well-finished models using appropriate materials.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Rendering – <ul style="list-style-type: none"> • Techniques of rendering with different mediums - demonstration and hands on • Final rendering complete sheet set using suitable rendering technique 	15 hours
Unit – II	Model-making – <ul style="list-style-type: none"> • Basic techniques of model making with different materials - demonstration and hands on simple solids • Cutting, folding, handling materials, neatness and finishing of models • Preparing models of the studied structure 	15 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV06
Course Title:	Visualization skills
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Develop better sketching skills, make realistic live proportionate sketches with correct perspective views and will also be able to express and communicate through the medium of sketches
- Develop better rendering skills, make technically correct and presentable rendered drawings that help in communicating their ideas or drawings better
- Develop better model-making skills, make precise, well-finished models using appropriate materials.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Sketching – <ul style="list-style-type: none"> • Techniques of sketching - demonstration and hands on, Selection of appropriate viewpoints for sketching of perspective views, overall view, detail elements, interior and exterior view, etc. • Live sketching on field and application of all the learnings 	10 hours
Unit – II	Collages – <ul style="list-style-type: none"> • Manual & digital ways, modern approaches etc • 2D Collages • 3D Collages 	10 hours
Unit – III	Model-making – <ul style="list-style-type: none"> • Model making with different materials - demonstration and hands on simple solids • Model-making is a medium to conceptualize ideas 	10 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV07
Course Title:	Movie Making
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Learn basic of movie making process
- Develop understanding of pre and post production processes

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Movie-making – <ul style="list-style-type: none"> • Development – concept, script-writing • Pre-production – storyboarding, role defining, location scouting, scheduling contents • Production – camera, scene composition • Post-production – editing, video & audio 	30 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV08
Course Title:	Soft Skills for Professionals
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

This Course will help students to prepare themselves for the professional career. It will help them to overcome fear of facing personal interviews and group discussion. They will learn to communicate and present themselves with professional competency. They will also develop an understanding of their role within the professional organization over and above the importance of team dynamics at a workplace.

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

1. Prepare their Resume/CV
2. Develop skills required for Personal Interviews.
3. Perform and Communicate as a Professional.
4. Become aware of their role as an Employee and a Team Player.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	<u>Resume Building</u> 4 hrs. <ul style="list-style-type: none"> • Understanding CV format • Significance of facts – Organizational skills for CVs • Discussion on various CVs related to different industries • A small CV making Exercise – CV writing skills • Discussion on portfolios • Assignment – build your CV 	4 hours
Unit – II	<u>Discussing individual CVs</u> <ul style="list-style-type: none"> • Corrections in CVs • Finalizing CVs • Adding portfolios where needed. 	4 hours



Unit – III	<u>Group Discussions</u> 8 hrs.	6 hours
	<ul style="list-style-type: none"> • Discussion on various topics of GD • Content of GDs • Performance based Analysis– what to expect • Strategic thinking and communication skills • Understanding non-verbal communication • Videos on group discussion 	
Unit-IV	<u>Mock Groups Discussions</u> 2hrs.	2 hours
	<ul style="list-style-type: none"> • Group discussion exercises – • Group discussion team competitions – video recording for assessment • Analyzing and discussing performances and contents • Presentation skills 	
Unit-V	<u>Mock interviews</u> 3 hrs	3 hours
	<ul style="list-style-type: none"> • One-on one interviews • Video shooting to be analyzed • Analysis and amendments • Assertiveness Vs. being positive 	
Unit-VI	<u>Team Vs. individual</u> 2 hrs	3 hours
	<ul style="list-style-type: none"> • Understanding Team dynamics • Being a team player – team goals and Individual goals • Team building exercises • Networking – social and professional 	
Unit-VII	Practicing Group Discussions	2 hours
	<ul style="list-style-type: none"> • CV corrections – as per the job descriptions of the invited firms 	
Unit-VIII	Practicing Group Discussions	3 hours
	<ul style="list-style-type: none"> • CV corrections – as per the job descriptions of the invited firms 	
Unit-IX	Mock interviews - with a panel of in-house faculties (if it's feasible)	3 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV09
Course Title:	Art in Architecture
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme						
L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -


- Appreciate the role of art in the built-environment
- Understand the significance of graphic in visual communication and architecture

Role of art in history of world architecture; Symbiotic relationship of folk art and architecture; application of different art forms in architecture; Visual communication in architecture and way finding; Works of different artists and architects that reflect the inter relationship

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Role of art – <ul style="list-style-type: none"> • Role of art in history of world architecture • Symbiotic relationship of folk art and architecture • Application of different art forms in architecture 	15 hours
Unit – II	Visual communication and Art – <ul style="list-style-type: none"> • Visual communication in architecture and way finding • Works of different artists and architects that reflect the inter relationship 	15 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV10
Course Title:	Graphic and Product Design
Course Type:	Value Added
Year of introduction:	2021

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

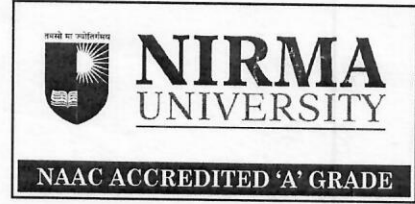
During the course, students will be able to -

- Interpret the importance and relevance of Graphic design
- Develop the knowledge of various compositions based on the typology.
- Understand product design and manufacturing process

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Principles s in graphic design – <ul style="list-style-type: none"> • Principles of Compositions in graphic design and Detail • Importance of Visual Balance & colors in signage 	10 hours
Unit – II	Introduction Of graphic Software <ul style="list-style-type: none"> • I.E. Coral Draw, Adobe Photoshop, Adobe Illustrators, Lightroom (Over View And Biggnier Level Exploration) Execution of Graphics <ul style="list-style-type: none"> • Introduction Of Printing or/and physically various method of execution of graphics 	8 hours
Unit – III	Product Design – <ul style="list-style-type: none"> • Concept of form and space in product design; Relating Form to Materials and Processes of Manufacture • Use of Computers for Form generation • Creativity techniques; product detailing and manufacture • Exploratory mockup models for concept development, refinement and detailing • Product design prototyping and advanced manufacturing processes • Preparing models of the studied structure 	12 hours



NU/AC/AC-300621/8(A)/21- 81
Date: 21.09.2021

NOTIFICATION

- Read: 1. R-44 – Empowering the Academic Council to approve Teaching & Examination Scheme, Syllabi, etc published vide notification No. NU-442 dated 27.01.2004
2. Notification No. NU-23 dated 24.07.2020 – Revision in TES and Syllabi of Semester-III of B.Arch. programme
3. Resolution No. 3(A) – Faculty of Architecture & Planning meeting – 09.04.2021
4. Resolution No. 8(A) – Academic Council meeting – 30.06.2021

Sub: Revision in the Teaching & Examination Scheme and Syllabi of Semester-III and V of B.Arch. programme in suppression of existing curricula

It is hereby notified for information of all concerned that the Academic Council in its meeting held on 30.06.2021 under resolution No. 8(A) in exercise of powers conferred upon it by the Board of Governors under regulation mentioned at serial 1 above and taking into consideration the recommendations of the Faculty of Architecture & Planning, has resolved to approve the revision in the Teaching & Examination Scheme and Syllabi of Semester-III and V of B.Arch. programme by way of replacing with new courses and revision in the existing courses in pursuance to the draft guidelines of Council of Architecture in supersession of existing curricula, to be made effective for the students registered in Semester-III and V in academic year 2021-22 onwards as per *Appendix-A* attached herewith.

Executive Registrar

Encl.: Appendix-A [Pages: 1 to 91]

To,

1. Dean, Faculty of Architecture & Planning
2. Academic Coordinator
3. Dy. Registrar: Exam; IAP

Copy to,

1. Exam Sec.
2. OS
3. Library
4. P.A. to ER

c.f.w.cs to: Director General

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Year of introduction:	2021

INSTITUTE OF ARCHITECTURE and PLANNING NIRMA UNIVERSITY									
TEACHING AND EXAMINATION SCHEME FOR SEMESTER III - 2021 onwards									
Name of the Programme: Bachelor of Architecture									
SEMESTER III									
Course Code	Name of the Course	Teaching Scheme				Scheme of Examination			
		Hours/Week			Credit	Hours	Component Weightage		
		L	W	S	C	SEE	SEE	CE	LPW
CORE COURSES									
2AR381	Architectural Design Studio - III	-	-	12	12	-	-	0.5	0.5
2AR382	History & Theory -III	2	-	-	2	3	0.3	0.5	0.2
2AR383	Building Construction & Technology - III	2	2	-	4	3	0.3	0.5	0.2
2AR384	Architectural Graphics Skills & Representation- III	1	2	-	3	-	-	0.5	0.5
2AR385	Structure - III	1	2	-	3	3	0.3	0.5	0.2
2AR386	Environmental Science & Services - I	1	1	-	2	3	0.3	0.5	0.2
2AR387	Introduction to Ecology and Landscape	2	1	-	3	-	-	0.5	0.5
2AR388#	Related Study Programme - II#	-	-	-	3#	-	-	-	1
Total		9	8	12	29/ 32#				
#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester VII and remaining 2 RSP up to Semester X.									
ELECTIVE COURSES									
Course Code	Course Name	L	T	P	C	SEE	SEE	CE	LPW
Yet to be decided	University Elective	3	-	-	3	-	0.4	0.6	-
\$ Credit of RSP will be given to those students who registers for RSP in the respective semester									
SUPPLEMENTARY COURSES/ VALUE ADDED COURSES									
Course Code	Course Name	L	W	S	C	SEE	SEE	CE	LPW
2ARS301	Social Work	-	2	-	-	-	-	-	1
2ARS302	Photography	-	2	-	-	-	-	-	1
L: Lecture T: Tutorial P: Practical W: Workshop S: Studio C: Credit CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination									
University Elective Courses:									

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR381		
Course Title:	Architectural Design Studio - III		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	12	12

Course Learning Outcomes (CLO):

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

- Compare the design and structural principle form natural object.
- Analyze and inspire design and principles of design from nature
- Explore the inspiration from nature for design with material understanding.
- Create, from the above exercise, into design, construction for manmade proposal.

Syllabus: 15 weeks (12 hours/week)

Total Teaching hours: 180 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Preparatory exercises/ Programmatic and site analysis – <ul style="list-style-type: none"> • Part – Whole relationship – Back and forth design processes • Exposure to materials, products, assembly constructional principles. • Site Analysis • Site location or context (Inside city/outside city) • Culture and Socio-economic condition • Climate and Topography • Built/open relation • Distribution of open space/green space • Focused on understanding the interrelationship between some of the fundamental aspects of architecture. • Design processes as an understanding of expression of nature/ establishing relationship with nature 	30 hours
Unit-II	Conceptual stage and Schematic design – <ul style="list-style-type: none"> • Explore the relationship between ‘order of structure’ and ‘order of space’. Structure is one of the important factors 	47 hours

- directly affecting the experience of space.
- Explore the importance of coherence between the rhythms of structure and space.
- Unit-III Preliminary design to Design development – 65 hours
- Understand the relation between various scales of space, forming a rhythm.
 - Create a coherent experience, it is important to know how to work with dimensional order which act as a unifying thread creating the consistency between the small and the big.
 - Application to know dynamics between different kinds of forces and material properties, which play an important role in constructing structures.
 - Correlation between material, structure and form
- Unit-IV Design Resolution with Synthesis of design parameters – 38 hours
- Explore the light as an animator of static space. It has a major influence on the experience of space.
 - Explore the ways of taking different kinds of light to enrich the experience.
 - Application and representation of concept and ideas

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/
References:

1. Ching, Francis D. K. Architecture--form, Space, & Order. Hoboken, NJ: John Wiley & Sons, 2007. Print.
2. Pollio, Vitruvius, and M. H. Morgan. Vitruvius: The Ten Books on Architecture. New York: Dover Publications, 1960. Print.
3. Ching, Francis D. K. Architecture, Form, Space & Order. New York: Van Nostrand Reinhold, 1979. Print.
4. Curtis, Nathaniel Cortlandt. Architectural Composition. Cleveland, O.: J.H. Jansen, 1923. Print.
5. Hardy, Adam. Indian Temple Architecture: Form and Transformation: The Karṇāṭa Drāviḍa Tradition, 7th to 13th Centuries. New Delhi: Indira Gandhi National Centre for the Arts, 1995. Print.
6. Dodds, George, Robert Tavernor, and Joseph Rykwert. Body and Building: Essays on the Changing Relation of Body and Architecture. Cambridge, MA: MIT, 2002. Print.
7. Ching, Francis D. K., Barry Onouye, and Douglas Zuberbuhler. Building Structures Illustrated. Print

8. Field, M. City Architecture; Or, Designs for Dwelling Houses, Stores, Hotels, Etc. In 20 Plates. With Descriptions and an Essay on the Principles of Design. New-York: D. Appleton, 1854. Print.
9. Yacobi, Haim. Constructing a Sense of Place: Architecture and the Zionist Discourse. Aldershot, Hants, England: Ashgate, 2004. Print.
10. Johnson, Paul-Alan. The Theory of Architecture: Concepts, Themes & Practices. New York: Van Nostrand Reinhold, 1994. Print.
11. Corbusier, Le, and Frederick Etchells. Towards a New Architecture by Le Corbusier. London: Architectural Pr., 1965. Print.
12. Allen, Edward. How Buildings Work: The Natural Order of Architecture. New York: Oxford UP, 1980. Print.
13. Pallasmaa, Juhani. The Thinking Hand: Existential and Embodied Wisdom in Architecture. Chichester, U.K.: Wiley, 2010. Print.
14. Rich, Peter Maurice., and Yvonne Dean. Principles of Element Design. Oxford: Aechitectural, 1999. Print.
15. Kostof, Spiro. A History of Architecture: Settings and Rituals. New York: Oxford UP, 1985. Print.
16. Wittkower, Rudolf. Architectural Principles in the Age of Humanism. New York: W.W. Norton, 1971. Print.
17. Corbusier, Le, Stanislaus Von. Moos, Arthur Rüegg, and Robert Venturi. Le Corbusier before Le Corbusier: Applied Arts, Architecture, Interiors, Painting, and Photography, 1907-1922: Exhibition Guide. New York: Bard Graduate Center for Studies in the Decorative Arts, Design, and Culture, 2002. Print.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR382		
Course Title:	History & Theory - III		
Course Type:	<input type="checkbox"/> Core	<input type="checkbox"/> Institute Elective	
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/> University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Demonstrate the understanding of architecture and urban form in settlements of medieval period
- Analyse the processes and causes that led to the creation of the architecture of an era
- Interpret the impact of factors that shape architecture within a culture
- Assess the impact of technology on the architecture

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Early Christian Architecture – <ul style="list-style-type: none"> • Emergence of early Christian architecture towards the end and the fall of Roman empire and its development into Byzantine architecture 	4 hours
Unit-II	Romanesque & Byzantine – <ul style="list-style-type: none"> • Romanesque & Byzantine Architecture as the evolution of artisanal craft and structural principal 	6 hours
Unit-III	Gothic – <ul style="list-style-type: none"> • The progress of technology, civilization and philosophy to create the architecture of the Gothic era 	8 hours
Unit-IV	Renaissance – <ul style="list-style-type: none"> • Renaissance in Europe. Early renaissance to high renaissance. Urban structure and space, institute form as expression of abstract ideals (work of architects like Brunelleschi, Bramante, Michael Angelo etc.) 	8 hours

Unit-V Baroque and Rococo –

4 hours

- Mannerism/ Late Renaissance as influenced by and a reaction to the ideals of the Renaissance architecture continuing to develop into Baroque and Rococo

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Lowry.B.(1987). Renaissance architecture. New York: Braziller.
2. Wittkower.R.(1998). Architectural principles in the age of humanism. Chichester, West Sussex Academy Editions
3. V.I.Atroshenko and Judith Collins, 1985, The Origins of the Romanesque. (Lund Humpheries, London
4. Fletcher, 1987. Banister. Sir Banister Fletcher's A History of Architecture. London: Butterworths.
5. Kostof. Spiro. 1985. A History of Architecture: Setting and Rituals. New York: Oxford UP.
6. Joachim E. Gaehde. 1989. "Pre-Romanesque Art". Dictionary of the Middle Ages
7. Tadgell, Christopher. A History of Architecture. London: Ellipsis, 2000.
8. Ching, Francis D.K. Mark Jarzombek and Vikrmaditya Prakash. 2007. A Global History of Architecture. Hoboken, NJ: J. Wiley & Sons.
9. Ward, John B. 1979. History of World Architecture. London: Faber. Print
10. Norberg-Schulz, Christian and Pier Luigi Nervi. 1971. History of World Architecture. New York: Abrams.
11. Bagenal, Philip. 1980 The Illustrated Atlas of the World's Great Buildings: A History of World Architecture. S.I.: Leisure.

12. Fazio, Michael W., Marian Moffett, Lawrence Wodehouse, and Marian Moffett. 2008. *A World History of Architecture* Boston: McGraw-Hill.
13. Browne, Edith A. 2005. *Romanesque Architecture*. Kessinger Publishing
14. Graber, O.1980. "Kubbat al-Sakhra". In Bosworth, C.E.; van Donzel, E.; Lewis, B.; et al. *The Encyclopedia of Islam, Volume 2, Part -1* (new ed.). Leiden: E.J.Brill.
15. Hillenbrand, Robert 1994. *Islamic Architecture: Form, Function, and Meaning*. New-York: Columbia University Press.
16. Willis, R. 1835. *Remarks on the Architecture of the Middle Ages, Especially of Italy*. Cambridge: The Pitt Press.
17. Moffett, Marian; Fazio, Michael W.; Wodehouse, Lawrence 2003. *A World History of Architecture* (illustrated ed.). London: Laurence King Publishing.
18. Krautheimer, Richard. 1986. *Early Christian and Byzantine Architecture* (4 ed.). Yale University Press
19. Jones. Tom Devonshire; Murray, Linda; Murray. Peter, eds. 2013. *The Oxford Dictionary of Christian Art and Architecture* (illustrated ed.) Oxford University Press.
20. Braun, Hugh, *An Introduction to English Mediaeval Architecture*, London: Faber and Faber. 1951.
21. Watkin, David. Sep 2005. *A History of Western Architecture*, Hali Publications
22. Kubach, Hans Erich: *Romanesque Architecture*, 1988.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR383		
Course Title:	Building Construction & Technology - III		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- Demonstrate basic principles for planning, design and construction of Floors, RCC frame structure and Openings as used in buildings.
- Apply requirement and criteria for making openings to build openings with various materials and techniques.
- Illustrate an understanding and explaining the principles of spanning system and their application.

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Understanding Floor Systems – <ul style="list-style-type: none"> • Understanding construction of wooden, steel, precast and RCC floor. • Various elements of floors: beams, slab, girders etc. • Types of floors: Flat slab, ribbed, metal deck, precast, etc. 	16 hours
Unit-II	Introduction to RCC Framed structure – <ul style="list-style-type: none"> • Understanding construction of RCC frame structure with all components like footing, columns, beams, slabs, infill walls etc. 	12 hours

Unit-III	Introduction to Materials and its properties –	12 hours
	<ul style="list-style-type: none"> • Metal: Properties and use of both ferrous and non-ferrous metals. • Glass and glass products: Manufacturing of glass, types of glass and their utilisation, etc 	
Unit-IV	Doors and windows –	20 hours
	<ul style="list-style-type: none"> • Understanding requirements, use and construction of openings (doors and windows) with timber, metal, PVC etc. • Components, assembly and manufacturing of doors and windows based on material and system. • Planning and design criteria related to openings. 	

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/

References:

1. Kotadiya A. S.. Building Construction. : Mahajan Publishing, 2014
2. Barry, R. Construction of Buildings Vol - 3: Single Storey Frames, Shells and Lightweight Coverings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
3. Barry, R. Construction of Buildings Vol - 4: Multi-Storey Buildings, Foundation and Substructures, Structural Steel Frames, External Walls and Cladding of Framed Buildings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
4. Barry, R.. Construction of Buildings Vol - 1: Foundations and Oversite Concrete, Walls, Floors, Roofs. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
5. Barry, R.. Construction of Buildings Vol - 2: Windows, Doors, Fibers, Stairs Finishes. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
6. Levy, Matthys. Why Buildings Fall Down: How Structures Fail. New York: W. W. Norton and Co., 2002
7. McKay J. K.. Building Construction Vol - 2: Metric. Delhi: Pearson Education Asia Pte. Ltd., 2014

8. McKay, J. K.. Building Construction Vol - 3: Metric. Delhi: Pearson Education Pte. Ltd., 2013
9. McKay, J. K.. Building Construction Vol - 4: Metric. Delhi: Pearson Education Pte. Ltd., 2013
10. Mckay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
11. Rangawala, S. C.. Building Construction. Anand: Charotar Publishing House, 2014
12. Rangwala, S. C.. Surveying and Leveling. Anand: Charotar Publishing House, 2011

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR384		
Course Title:	Architectural Graphic Skills & Representation– III		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Utilize two-dimensional digital software
- Maximize possibilities of representation on an analytical level.
- Imagine and illustrate complex forms using software and will be able to manifest it in a physical model.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Representation Techniques using drafting software – <ul style="list-style-type: none"> • Fundamentals of Drafting softwares (Setting up Scale & Units, Working With Layers, Line weights, Composition of different scaled drawings in single sheet, Plotting etc) • Advanced Geometry, Pattern making and analysis • Uses of computer generated drawings to execute basic design ideas (Physical model & Drawings) 	15 hours
Unit-II	Understanding a complex forms & Surfaces – <ul style="list-style-type: none"> • Understand and learn modelling software • Loft, sweep, Doubly curved surfaces 	20 hours

- Interpenetrations of Solids (Interpenetrations of Flat & Curved Surfaces, Interpenetrations of solid forms)

- Multiple Section Method (Digital model, Physical model & Drawings)

Unit-III Representation Techniques using other software –

10 hours

- Illustrate digital representation by using graphic based softwares
- Understanding difference between Raster & vector base software
- Exploring the ideas of rendering, composing and compiling architectural work.

Self Study:

Suggested List of Experiments:

Suggested Case List:

- Suggested Readings/ References:
1. Botello, C. (2011). *Adobe Illustrator CS5 illustrated*. Boston: Cengage Learning.
 2. Farrelly, L. (2008). *Representational techniques*. Lausanne: AVA Book.
 3. Helsel, J. D. (2007). *Engineering drawing and design*. Place of publication not identified: Glencoe McGraw-Hill Post.
 4. John, E. (2013). *CAD fundamentals for architecture*. London: Laurence King Publishing.
 5. Onstott, S. (2011). *Enhancing architectural drawings and models with photoshop*. San Francisco: Wiley Pub.
 6. Onstott, S. (2012). *AUTOCAD 2013 AND AUTOCAD LT 2013: ESSENTIALS*. Hoboken, NJ: John Wiley & Sons.
 7. Pottmann, H., Asperl, A., Hofer, M., & Bentley, D. (2009). *Architectural geometry*. Exton: Bentley Institute Press.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR385		
Course Title:	Structure III		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/> Institute Elective	
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/> University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Develop to gain understanding by using the abstract method of analysis of structures
- Evaluate and develop understanding of basic requirement of stability and strength of materials.
- Evaluate and infer structural elements and their significance in Structural System.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Concept of Centre of gravity – <ul style="list-style-type: none"> • Determining the centroid of simple figures. • Moment of inertia, its application to sections subjected to bending, determining M.I. of simple and compound sections 	9 hours
Unit-II	Resolution of forces – <ul style="list-style-type: none"> • Concept of triangulation and its application in pin jointed trusses • Assumption in strength of materials, basic terminology, brief history of strength of materials. • Concept & importance of the shear force and the bending moment. • Pure Bending stress & combined direct and bending stresses 	12 hours

Unit-III	Stability, buckling of columns –	10 hours
	<ul style="list-style-type: none"> • Short and long columns • Deflection and its importance, code provisions, study of the deflected shape of simple structures. • Solutions of problems. 	
Unit-IV	Concept of shear stress –	10 hours
	<ul style="list-style-type: none"> • Average and maximum shears stress. • Horizontal shear stress and its variation across the cross section of the beam 	
Unit- V	Composite sections –	4 hours
	<ul style="list-style-type: none"> • Sections made up of more than one material 	

Self Study:

Suggested List of
Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR386		
Course Title:	Environmental Science & Services – I		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	1	-	2

Course Learning Outcomes (CLO):

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

- Explain and relate the role and importance of climate as one of the major determinants of built form.
- Identify and interpret the implication of climate as modifying factor of built environment.
- Comprehend various climate-controlling devices.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction to climatology – <ul style="list-style-type: none"> • Elements of climate Solar Geometry its effect & importance • Built environment, conditions, impact and issues of climatic balance in traditional/ vernacular and contemporary built environments. • Study of Passive Environmental Control Mechanisms • Tropics and its Climatic zones • Macro and Micro Climate (site climate). • Implications of climatic forces in nature of spaces and forms, patterns of organization, & elements of built form at individual building & collective form 	18 hours

Unit-II Thermal Comfort –

- Understanding of human body's comfort level.
 - Thermal comfort indices
 - Defining Comfort, Comfort zone & scale.
 - Different way of heat gain in the building.
 - Behavior & properties of material/s
 - Psychometrics study and analysis.
- Studies through built environment, case analysis, theory and its application, models and testing.

12 hours

Self Study:

Suggested List of

Experiments:

Suggested Case

List:

Suggested

Readings/

References:

1. Ahluwalia, V K. Environmental Science. New Delhi :The Energy and resources Institute, 2015.Print.
2. Koenigsberger, Ingersoll, Mayhew, Szokolay, Manual of Tropical Housing & Building, Hyderabad:Universities Press, March 2010
3. Krishan A, Baker, Climate Responsive Architecture: Tata McGraw-Hill Education (Asia) Co.& China Architecture &Building Press, 2004/2005
4. Kukreja. C P, Tropical Architecture: Tata McGraw-Hill Publishing Company, 1978
5. Shah. M G, Padki. S Y, Kale, C M, Building Drawing: with an integrated approach to built environment, New Delhi: Tata McGraw-Hill Education, 2002
6. Dekay, Mark, Sun, Wind, And Light: Architectural Design Strategies. USA: John and Wiley Sons, Inc., 2014
7. Olgay,Victor. Design With Climate – Bio-Climatic Approach to Architectural Regionalism. New Jersey: Princeton University Press,1963
8. Tipnis, Aishwarya.Vernacular Traditions- Contemporary Architecture. New Delhi: The Energy and resources Institute, 2012, Print.
9. Nayak,J K. Hazra, R . Prajapati, J. Manual On Solar Passive Architecure. New Delhi: Solar Energy Centre, MNES, Gov. Of India, 1999
10. Galloe, Salam and Sayigh A.M.M. Architecture, Comfort and Energy, U.K : Elsevier Science Ltd., Oxford, 1998

11. B. Givoni. Passive and Low Energy Cooling of building, New York: Van Nortrand Reinhold,1994
12. B. Givoni. Man,Climate and Architecture, Architectural Sciences Series – applied, London: Science Publishers Ltd.,1981
13. Martin Evans , Housing Climate and Comfort, London : Architectural Press,1980
14. Passivhaus Designer's Manual: A Technical Guide to Low and Zero Energy Buildings: Routledge Taylor & Francis Ltd.
15. Oliver, Paul. Built to meet needs: cultural issues in vernacular architecture: Burlington, Elsevier. 2006
16. Majmudar, Mili. Energy Efficient Building in India. New Delhi: The Energy and resources Institute.
17. Bansal, K N.Mathur, Jyotirmay & Rndall,McMullen.Energy
18. Efficient Window Book.
19. Laureano.Water conservation techniques in traditional human sattlements. Ghaziabad: Copal, 2013
20. Chawla, Shashi .Textbook of Environmental Studies .New Delhi:Tata McGraw Hill Education Private Limited,2013
21. Rajagopalan, R. .Environmental Studies: From Crisis to Cure .New Delhi:Oxford University Press,2011
22. Desai, Madhavi .Traditional Architecture: House From of the Islamic Community of Bohras in Gujarat .Maharashtra:National Institute of Advanced Stuides in Architecture (NIASA), COA,2007

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR387		
Course Title:	Introduction to Ecology and Landscape		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	1	-	3

Course Learning Outcomes (CLO):

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

- Develop an understanding of basic concepts of landscape systems
- Understand ecological issues pertaining to human settlements and design interventions
- Learn about major ideas of natural selection, ecology, community, biodiversity, climate change and sustainability

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction to Ecology – • Discussion and discourse on assessing the Value of Ecosystem and Ecosystem Services	6 Hours
Unit-II	Interaction in Ecological community – • Time problem – Based on population and prediction of change over time – assess the prediction based on based on their ecological logic and feasibility.	6 Hours
Unit-III	Ecological cycle – • Inter-relationships between ecological cycles • Discuss how ecological flows are inter-related and compare and contrast different ways of representing information on a concept map.	9 Hours
Unit-IV	Impact of Architectural Design on sustainability – • Exploring Building Life Cycle Assessment though digital and physical models	6 Hours

Unit-V	Introduction to Landscape –	
	<ul style="list-style-type: none"> • Definitions of Landscape terminologies • Elements of Landscape: Natural / Manmade. (Lightening, Paving, Fencing & Edging, Stones, Wood, Plants, water, Landform, Timber, Metal, Glass). 	9 hours
Unit-VI	Understanding the Site, Role of Vegetation & Planting –	9 hours
	<ul style="list-style-type: none"> • Introduction to site features, topography / Land Forms, Wind flow, Air quality, Hydrology, climate and vegetation • Understanding TREE Architecture / FORM- Identification, botanical, common name, type, native- exotic, Span, height, girth, Life, Purpose, Flowering & fruiting season/ colour, etc., climatic consideration 	

Self Study:

Suggested List of Experiments:

Suggested Case List:

- Suggested Readings/ References:
1. Samuelson P, Nordhaus W, *Economics*, McGraw Hill Education (India) Pvt.Ltd., New Delhi, 2010
 2. Samuelson P, Nordhaus, *MicroEconomics*, McGraw Hill Education (India) Pvt.Ltd., New Delhi, 2013
 3. Deodhar S, *Day to Day Economics*, Random House India, Gurgaon, 2012
 4. Mankiw, N. G. *Principles of Economics* (Sixth ed.). Cengage Learning. 2012.
 5. Musgrave and Musgrave *Public Finance in Theory and Practice* McGraw Hill Education (India) Pvt.Ltd., New Delhi. 2004.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR388		
Course Title:	Related Study Programme (RSP)-II		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	3

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 weeks (30 hours / week)

Total Teaching hours: 90 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals – <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	Compilation and documentation – <ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	30 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2ARS301		
Course Title:	Social Work		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

At the end of the course, students will be able to:
Understand social work role and develop the knowledge and theory associated with social work practice • Work with NGO's & participate in social welfare work towards society development.

1. Become aware of the role and need of social work in the society
2. Appraise the methods and techniques of social work and its practice
3. Develop awareness and participate in social welfare work towards society development

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Understanding social in social work – <ul style="list-style-type: none"> • Sensitive to the needs of different people within the society and to social problems in changing social, cultural and techno-economic context; 	10 Hours
Unit-II	Social work as a practice – <ul style="list-style-type: none"> • To inculcate in the need for inquiring and research to understand the social issues/ problems within a context • Develop problem solving and decision making abilities for relevant concerns through the medium of social work as a practice 	20 Hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

- Suggested Readings/ References:
1. Banks, S. (1995). Ethics and Values in Social Work: Practical Social Work Series, London: Macmillan Press Ltd.
 2. Friedlander, Walter A. (1977) Concepts and Methods of Social Work, New Delhi: Prentice Hall of India Pvt. Ltd
 3. Heun, Linda R., Heun, Richard E. (2001) Developing Skills for Human Interaction, London: Charles E. Merrill Co.
 4. Skidmore, Rex A.(1982), Introduction to Social Work, New Jersey, Thackeray, Milton G. Prentice-Hall, Englewood Cliffs.
 5. Surendra Singh (Chief Editor). (2012): Encyclopedia of Social Work in India. Lucknow: New Royal Book Company.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2ARS302		
Course Title:	Photography		
Course Type:	<input type="checkbox"/>	Core	Institute Elective
	<input checked="" type="checkbox"/>	Value Added Course	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

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

1. Know about other equipment (Filters, Exposer Meter) apart from Camera used in Photography.
2. Learn about photographic processes to be followed within various contexts.
3. Selecting and Editing of Photos for various subjects.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Understanding of Photography Equipment (Electronic Light & Light Meter) – <ul style="list-style-type: none"> • Studio Lights for Various Photo shoot • Camera: Types, Technical specifications • Utility of Different Lenses. (Perspective Correction Lens, Tele Lenses etc.) 	10 Hours
Unit-II	Photographic processes – <ul style="list-style-type: none"> • Understanding subject requirements to be captured through photography medium. • Steps to be followed for photographic processes within context of various themes such as art, urban settings, heritage conservation, low light conditions, etc. • Understanding Artificial & Natural Light. (White Balance) 	20 Hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

- Suggested Readings/ References:
1. Videos of many prominent photographers work and their understanding there famous photos and talks by them.
 2. Photography Documentaries.
 3. Photography Movies. (Baraka, Samsara and Visual Aquatics etc)
 4. Photography Books (Kodak Digital Photo Book, Decisive Moment HCB.
 5. Alaha Of the World (DDD)
 6. Oriental Moon
 7. Internal America
 8. India By Raghuver Singh
 9. Taj Mahal By Raghu Rai
 10. Calcutta By Satyajee Ray
 11. Independent India By Government Of India.

**NIRMA UNIVERSITY
INSTITUTE OF ARCHITECTURE AND PLANNING**

**TEACHING AND EXAMINATION SCHEME FOR SEMESTER V - B.ARCH.
(2021 onwards)**

**Name of the Programme: Bachelor of Architecture
SEMESTER V**

Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination		
		Hours/Week			Credit		SEE	Component Weightage	
		L	W	S	C	SEE		CE	LPW
CORE COURSES									
2AR561	Architectural Design Studio - V	-	-	12	12	-	-	0.5	0.5
2AR562	History & Theory - V	2	-	-	2	3	0.3	0.5	0.2
2AR563	Building Construction & Technology - V	2	2	-	4	3	0.3	0.5	0.2
2AR564	Landscape Design	2	-	-	2	-	-	0.5	0.5
2AR565	Environmental Science & Services - III	1	2	-	3	3	0.3	0.5	0.2
2AR566	Digital Technology in Architecture-I	1	2	-	3	-	-	0.5	0.5
2AR567#	Related Study Programme - IV#	-	-	-	4#	-	-	-	1
#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester VII and remaining 2 RSP up to Semester X.									
Institute Elective courses as per Annexure-1									
	Elective	1	1	-	2	-	-	0.5	0.5
	Elective	1	1	-	2	-	-	0.5	0.5
Total		10	8	12	30/ 34\$				
\$ Credit of RSP will be given to those students who registers for RSP in the respective semester									
L: Lecture, W: Workshop, S: Studio, C: Credit CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination									

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Year of introduction:	2021

Institute Elective Courses for Semester-5 and Semester-6:

Institute Elective Courses (For Semester- V and VI)*:	
2AREA01	Leather craft
2AREA02	Pottery
2AREA03	Claywork/ Terracotta/ Ceramic
2AREA04	Furniture design
2AREA05	Performing Arts
2AREA06	Graphic Signage
2AREA07	Collages and Montages
2AREA08	Metal craft
2AREA09	Casting/ Moulding (Pop, Metal, resin, fiber)
2AREA10	Print (Lithography/ Linography/ Woodcut/ Metal print)
2AREA11	Colour in Architecture
2AREA12	Building Energy Modelling and simulation
2AREA13	Methods of Architectural documentation
2AREA14	Stage and set design
2AREA15	Art Appreciation
2AREA16	Creative writing
2AREA17	Film Appreciation
2AREA18	Journalism – An Introduction
2AREA19	Programming language – Fundamentals
2AREA20	Temporary structures
2AREA21	Bamboo construction
2AREA22	Bio-mimicry
2AREA23	M S Office
2AREA24	Building Information Modelling (BIM)
2AREA25	Structure-V
2AREA26	Caricature
2AREA27	Traditional Arts & Craft
2AREA28	Earthquake Resistant Buildings

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR561		
Course Title:	Architectural Design Studio - V		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	12	12

Course Learning Outcomes (CLO):

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

- Develop vocabulary which defines the institutional character.
- Analyze Site and Landscape systems
- Create Abstract Models, Part detail constructional models, design development methods that clarify part-whole relationships
- Invent detailed architectural design of the proposed building

Syllabus: 15 weeks (12 hours/week)

Total Teaching hours: 180 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Preparatory exercises/ Programmatic and site analysis – <ul style="list-style-type: none"> • Explore different design ideas of institutional character • Institutional Image, Theme, Concept. • Institutional Scale • Influences of culture, climate, structure safety, construction technology & special aspects of site conditions. 	24 hours
Unit-II	Conceptual stage and Schematic design – <ul style="list-style-type: none"> • Organization & Disposition of spaces • purpose, requirement, interpretation, usage, hierarchy of space-built form, circulation patterns etc. • Explore forms, new techniques and materials 	48 hours
Unit-III	Preliminary design to Design development - <ul style="list-style-type: none"> • Analysis of various buildings elements-foundation-wall-floor-roof etc. 	72 hours

- Resolution of appropriate systems
- Explanation of structure system
- logical reasoning and practical solution for the proposed built form.

Unit-IV Design Resolution with Synthesis of design parameters - 36 hours

- Site Development-Landscape
- Respond to features of the site and the immediate surrounding area
- Site's dimensions and areas
- Approach Road and pedestrian access points;
- services and infrastructure (e.g. electricity poles, storm water drainage lines, natural drainage, curb, crossings);
- views to and from the site
- Climatic studies

Self-Study:
Suggested List
of Experiments:
Suggested Case
List:

Suggested
Readings/
References:

- 1) Ching, F. D. K. (2007). *Architecture--form, space, and order*.
- 2) Neufert, E., Neufert, P., & Kister, J. (2012). *Neufert*. Oxford: Wiley-Blackwell.
- 3) Tilley, A. R., & Henry Dreyfuss Associates. (2002). *The measure of man and woman: Human factors in design*. New York: Wiley.
- 4) Alexander, C., Alexander, C., & Alexander, C. (1980). *The timeless way of building*. New York: Oxford University Press.
- 5) Alexander, C., Ishikawa, S., & Silverstein, M. (2010). *A pattern language: Towns, buildings, construction*. New York: Oxford Univ. Pr.
- 6) Lassus, B. (1998). *The landscape approach*. Philadelphia: University of Pennsylvania Press.
- 7) Tuan, Y. (2011). *Space and place: The perspective of experience*. Minneapolis, MN: University of Minnesota Press.
- 8) Venturi, R. (1977). *Complexity and contradiction in architecture*: Robert Venturi. Place of publication not identified: Architectural Press/Museum of Modern Art.
- 9) Zeisel, J. (1981). *Inquiry by design: Tools for environment-behavior research*. Cambridge: Cambridge University Press.
- 10) Booth, N. K. (1990). *Basic elements of landscape architectural design*. Prospect Heights, IL: Waveland.

- 11) Eckbo, G. (2009). Landscape for living. Amherst, MA: University of Massachusetts Press.
- 12) HALPRIN, L. (1976). The RSVP cycles creative processes in the human environment. New York, NY: Braziller.
- 13) Laurie, M. (1986). An introduction to landscape architecture. New York: Elsevier.
- 14) Lynch, K. (2012). Site planning. Whitefish, MT: Literary Licensing.
- 15) Simonds, J. O. (1968). Landscape architecture: The shaping of mans natural environment. New York: Dodge.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR562		
Course Title:	History and Theory-V		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Summarise an understating of the architecture and planning in Europe, America and India, during late 17th C to the 20th C, as an outcome of technological, social and political revolutions of the time.
- Classify and analyse principles and characteristics of Modern Architecture.
- Discuss the forces of colonization and colonial architecture in the Indian subcontinent.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Industrial Revolution – <ul style="list-style-type: none"> • Enlightenment (the age of reason) and the French revolution • Industrial revolution as a socio-economic paradigm shift • The industrial city and evolution of reform movements • Impact of new materials, building techniques and industrial processes on architecture and aesthetics • Architectural styles: Neo Classical, Gothic Revival , Art Nouveau, etc • Brief upon works of Etienne Boullée, Nicolas Ledoux, Joseph Paxton, Viollet-le-Duc, Louis Sullivan, Antonio Gaudí, Henri Labrouste, etc 	6 hours

Unit-II	<p>Modern Movement in Architecture –</p> <ul style="list-style-type: none"> • Influence of Art & Design movements like Bauhaus, De Stijl, Cubism, constructivism etc. • Characteristics of Modern architecture: Machine aesthetic, universal appeal, form follows function, rejection of ornament, simplicity of forms, etc. • Works of Frank Lloyd Wright, Le Corbusier, Walter Gropius, Mies Van der Rohe, Alvar Aalto, Louis Kahn and other modernists • Antecedents and precedents of the Modern movement. 	18 hours
Unit-III	<p>Colonial Architecture -</p> <ul style="list-style-type: none"> • The phenomenon of colonisation and expansion of European dominance over large parts of the world. • Brief Socio-political and economic history of India during from 17th C to 20th C under influence of Portuguese, French, British and Dutch colonizers. • Imposition, modification and assimilation of architectural forms and styles: from Neo-classical to Indo-Sarcentic. • Introduction of new building types (bungalow, railway stations, etc) new materials (cast iron, steel, etc) and techniques (pre-fabrication, etc). • New directions in Urban Design and urban planning in colonial India: Calcutta, Bombay, Madras, New Delhi, Pondicherry, Daman & Diu, Goa, Baroda, etc 	6 hours

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/

References:

1. Levine, N., & Wright, F. L. (1996). The architecture of Frank Lloyd Wright. Princeton, N.J: Princeton University Press.
2. Norberg-Schulz, C. (2000). Principles of modern architecture. London: Andreas Papadakis Publisher.
3. Ching, F. D. K. (2010). Architecture: Form, Space, and Order. Hoboken: John Wiley & Sons, Inc
4. Frampton, K. (2014). Modern architecture: A critical history. London: Thames & Hudson.
5. Curtis, W. J. R. (2013). Modern architecture since 1900. London: Phaidon.
6. Le, C., Jeanneret, P., In Boesiger, W., In Stonorov, O., & In Bill, M. (1929). Le Corbusier: Oeuvre complète. Basel: Birkhäuser.
7. Pfeiffer, B. B. (2009). Frank Lloyd Wright: The heroic years : 1920-1932. New York: Rizzoli International.

8. Colquhoun, A., & Oxford University Press. (2006). *Modern architecture*. Oxford: Oxford University Press.
9. Gropius, W., & Shand, P. M. (1998). *The new architecture and the Bauhaus*. Cambridge, Mass: M.I.T. Press.
10. Lawrence, S. E., Cooper-Hewitt, National Design Museum, Smithsonian Institution, & Teylers Museum. (2007). *Piranesi as designer*. New York, N.Y: Assouline Publishing
11. Morrison, H. (2001). *Louis Sullivan: Prophet of modern architecture*. New York: W.W. Norton & Company.
12. Bélier, C., Bergdoll, B., Le, C. M., & Bresson. M. (2013). *Henri Labrouste - structure brought to light: [exhibition at The Museum of Modern Art, New York, March 10 - June 24, 2013]*. New York: Museum of Modern Art.
13. Dwivedi, S., & Mehrotra, R. (2001). *Bombay: The cities within*. Bombay: Eminence Designs Pvt. Ltd
14. Frampton, K., Cava, J., & MIT Press. (2007). *Studies in tectonic culture: The poetics of construction in nineteenth and twentieth century architecture*. Chicago, IL: Graham Foundation for Advanced Studies in the Fine Arts.
15. Giedion, S. (2008). *Space, time and architecture: The growth of a new tradition*. London: Harvard University Press.
16. Lang, J., Desai, M., & Desai, M. (2000). *Architecture and independence: The search for identity - India 1880 to 1980*. Delhi: Oxford University Press.
17. Kostof, S. (1985). *A history of architecture: Settings and rituals*. New York: Oxford University Press.
18. Mokyr, J. (2011). *The enlightened economy: Britain and the industrial revolution*. London: Penguin.
19. Metcalf, T. R. (2002). *An imperial vision: Indian architecture and Britain's raj*. New Delhi: Oxford University Press.
20. Desai, Madhavi. (2017). *BUNGALOW IN TWENTIETH-CENTURY INDIA: The cultural expression of changing ways of life and aspirations in the domestic architecture of coloni*. Place of publication not identified: ROUTLEDGE.
21. Scriver, P., & Prakash, V. (2007). *Colonial modernities: Building, dwelling and architecture in British India and Ceylon*. London: Routledge.
22. Chopra, P. (2011). *A joint enterprise: Indian elites and the making of British Bombay*. Minneapolis: University of Minnesota Press.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR563		
Course Title:	Building Construction & Technology - V		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- Explain and illustrate use of long span building construction systems.
- Explain Modular and pre-fabricated construction and its application
- Analyze, categorize and decide the use of building finishes with respect to materials and appropriate detailing in buildings.

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Large Span Construction – <ul style="list-style-type: none"> • Introduction to a wide range of modern building construction systems incorporating the use of metals like steel, aluminum and composite materials. • Flat slab, beam and ribbed slab, waffle slab, vault, dome, shell structure, steel trusses, girder, portal frame, Space frames folded plate structure. • Pre- Engineered Buildings. 	28 hours
Unit-II	Modular and pre-fabricated construction – <ul style="list-style-type: none"> • Prefabricated construction of building components. • Pre-tensioning and Post-tensioning of RCC members. • Pre-stressing and its advantages 	16 hours
Unit-III	Finishes – <ul style="list-style-type: none"> • Different types of Interior, Exterior, Vertical & Horizontal Finishes i.e. plaster, paint, texture, paving, cladding, flooring, paneling, etc. 	16 hours

Self Study:
Suggested List of
Experiments:
Suggested Case
List:
Suggested
Readings/
References:

- Barry, R. Construction of Buildings Vol - 3: Single Storey Frames, Shells and Lightweight Coverings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
- Barry, R. Construction of Buildings Vol - 4: Multi-Storey Buildings, Foundation and Substructures, Structural Steel Frames, External Walls and Cladding of Framed Buildings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
- McKay J. K.. Building Construction Vol - 2: Metric. Delhi: Pearson Education Asia Pte. Ltd., 2014
- McKay, J. K.. Building Construction Vol - 3: Metric. Delhi: Pearson Education Pte. Ltd., 2013
- McKay, J. K.. Building Construction Vol - 4: Metric. Delhi: Pearson Education Pte. Ltd., 2013
- Mckay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
- McLeod, Virginia. Detail In Contemporary Timber Architecture. UK: Laurence King Publishing, 2010
- Millias, Malcolm . Building structures from concept to design . London: Spon Press, 2005
- Muttoni, Aurelio. Art of Structures: Introduction to the Functioning of Structures in Architecture. UK: Taylor & Francis, 2011
- Paulson, Boyd C.. Computer Applications in Construction. New Delhi: McGraw Hill Education India Pvt Ltd, 2014
- Phillips, David. Detail In Contemporary Concrete Architecture. UK: Laurence King Publishing Ltd, 2012
- Punaima, B. C.. Comprehensive Design of Steel Structures. New Delhi: Laxmi Publications Pvt. Ltd., 2012
- Punmia, B. C.. Building Construction. New Delhi: Laxmi Publications Pvt. Ltd., 2008
- Rangawala, S. C.. Building Construction. Anand: Charotar Publishing House, 2014
- Ruske, Wolfgang. Timber Construction for Trade, Industry, Administration: Basics and Projects. Switzerland: Birkhauser-Publisher of Architecture, 2004
- Salvadori, Mario. Why Buildings Stand Up: The Strength of Architecture. New York: W. W. Norton and Co., 1980
- Schodek, Daniel L.. Structures. New Delhi: PHI Learning Private Limited, 2014
- Watson, Donald. Time saver Standards for Building Materials and Systems: Design Criteria and Selection Data. New Delhi: Tata McGraw Hill Education Private Limited, 2009

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR564		
Course Title:	Landscape Design		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Interpret the concepts of Landscape systems.
- Develop the skills of Site Analysis and clarify part to whole and outdoor-indoor relationships.
- Elaborate the capacity of Landscape design in an architectural project.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	<p>Understanding the Site, Role of Vegetation & Planting Design Considerations - Macro & Micro Conditions –</p> <ul style="list-style-type: none"> • Site features, topography / Land Forms, Wind flow, Air quality, Hydrology. • Climate and vegetation (Role of vegetation in Landscape Design- environmental, ecological, health, economic, aesthetic – functional & structural characteristics, visual & other sensory, cultural). • Understanding TREE Architecture / FORM- Identification, botanical, common name, type, native- exotic, Span, height, girth, Life, Purpose, Flowering & fruiting season/ colour, etc., climatic consideration • Planting Design Considerations (Plant material , soil conditions, availability and quality of water, availability of sunlight, quality of Air, Maintenances, Functional aspects of design with plants, planting for shelter & soil conservation, air pollution control by plants). 	10 hours

	<ul style="list-style-type: none"> • Plant Material & Climate: Traditional know how of plants / Native landscape, Organic Gardening. • Identification of Plant Material 	
Unit-II	Landscape and Planting Design – <ul style="list-style-type: none"> • Definitions of Landscape terminologies • Elements of Landscape: Natural / Manmade. (Lightening, Paving, Fencing & Edging, Stones, Wood, Plants, water, Landform, Timber, Metal, Glass). • Principals of Landscape: Contrast, Texture, Colour, Scale, Rhythm, Sequence, Repetition, unity, balance, simplicity, variety. • Attitude to Landscape Design in the historical Indian context & comparisons to other parts of the world. (Indian / Chinese / Japanese / English / French / Italian / Mughal). 	8 hours
Unit-III	Understanding of Hard and Soft Landscape – <ul style="list-style-type: none"> • Hard Landscape: pathways, water bodies, Benches, Gazebbos, Pergola, etc. • Plants and Indoor Air quality. • Process of Planting and Transplanting of Trees. 	8 hours
Unit-IV	Landscape Design & Site Planning Opportunity – <ul style="list-style-type: none"> • Zones / green belt, regional park, city park, district park, community park, multipurpose open space. • Design (Bones, colour, focal points, textures, sound). 	4 hours

Self Study:

Suggested List of

Experiments:

Suggested Case List:

Suggested Readings/

References:

1. Laurie, M. (1983). *Introducción a la arquitectura del paisaje/An introduction to landscape architecture* (No. 712). Gustavo Gili,.
2. Lynch, K. (1960). *The image of the city* (Vol. 11). MIT press.
3. Lynch, K., Lynch, K. R., & Hack, G. (1984). *Site planning*. MIT press.
4. Alexander, C. (1979). *The timeless way of building* (Vol. 1). New York: Oxford University Press.
5. Cooper, G., & Taylor, G. (2000). *Gardens for the Future: Gestures against the Wild*. Conran Octopus.
6. Groth, P., Groth, P. E., & Bressi, T. W. (Eds.). (1997). *Understanding ordinary landscapes*. Yale University Press.
7. Bose, T. K., Chowdhury, B., & Sharma, S. P. (2008). *Shrubs, Tropical garden Plants in Colour*.

8. Amoroso, N. (2019). *Representing Landscapes: Analogue*. Routledge.
9. Beer, A. R. (1987). *An introduction to landscape architecture: by Michael Laurie*. Elsevier Science Publishers, Amsterdam, The Netherlands, 11th repr., 1985, x+ 214 pp., price (paperback) US \$27.25/Dfl. 135.00, ISBN 0-444-00171-9.
10. Starke, B. W., & Simonds, J. O. (2013). *Landscape architecture: A manual of environmental planning and design*. New York: McGraw-Hill Education.
11. Zaitzevsky, C. (1982). *Frederick Law Olmsted and the Boston park system* (p. 96). Boston, MA: Belknap Press.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR565		
Course Title:	Environmental Science & Services – III		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Explain the basic principles of Artificial light & electrification
- Explore methods of Heating & cooling devices for natural and artificially ventilated building design
- Determine & Apply principles of fire safety in Building Design.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Artificial light, Electrification & Communication Network – <ul style="list-style-type: none"> • Basic electrical supply & distribution to the building, alternate supply & Power connections. Various components & elements of layouts as per use, lifesaving auto-cut circuits & other fixtures. Communication systems like fax, telecom, EPABX, alarm, audio-video monitoring, etc. & their layouts. Criteria of designing of various communicating service layouts 	27 hours
Unit-II	H.V.A.C. [Heating, Ventilating, Air-conditioning and cooling] – <ul style="list-style-type: none"> • Mechanical thermal controls, its type, effects of it on heating, ventilating, air-conditioning or cooling an enclosed space. Air-conditioning or cooling systems, various types in practice, chilled water cooling system-air handling package unit & their installation, demand and consumption as per use & volume of space. Supply plants and service layouts, supply and return air's ducting and Channeling systems, calculations for consumption and basic sizes of Components 	12 hours

Unit-III Fire fighting & Protection –

6 hours

- Study of fire fighting regulations, fire alarming & extinguishing system, fire hydrants-their types, location, spacing, distance & specifications. Fire resistance of different building materials, designing of fires resistant door, gangway, and stair & lift block for escape. Case studies of service and escape layouts of building for fire protection system & requirement.
- Water consumption for various activities & designing the plumbing system.

Self Study:

Suggested List of

Experiments:

Suggested Case

List:

Suggested

Readings/

References:

1. Prakash, N. Sesha .(2011), Manual of Fire Safety .New Delhi: CBS Publishers and Distributors.
2. Parker, S. (2005), Eyewitness Electricity. Dorling Kindersley,
3. Sugarman, S. C. (2015), Testing and balancing HVAC air and water systems. Lulu press, Inc.
4. Grondzik, W. T., & Kwok, A. G. (2014). Mechanical and electrical equipment for buildings. John Wiley & Sons.
5. Roberts, Victor & Krepchin, Ira Eds. (2005), Lighting : technology atlas Book. Colorado :Platts research and consulting.
6. Howell, Ronald H. & others., (2009), Principles of heating ventilating and air conditioning : a textbook with design data based on the 2009 ASHRAE handbook - fundamentals . Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
7. VP Lang, (1961), Basics of Air conditioning.
8. HW Stanford III, AF Spach , (2019), Analysis & Design of Heating, Ventilation & Air conditioning systems.
9. M Karlen, C Spangler, J R Benya , (2017), Lighting design basics.
10. H Koster, (2004), Dynamic day lighting architecture: basics, systems and projects.
11. D Philips, (2013), Lighting modern buildings.
12. Roman Showranek , Basics of building services lighting design.

13. Winchip M Susan , (2017), Fundamentals of lighting.
14. Mcnamara Carmel , Bright 2 : Architectural illumination & light installations.
15. Tomczyk John , Silberstein Eugene, Whitman Bill, Johnson Bill, (2012), Refrigeration & Air conditioning technology.
16. Althouse AD, Turnquist CH, Bracciano AF, (1968), Modern refrigeration & Air conditioning Book: theory, practice of refrigeration & air conditioning systems

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR566		
Course Title:	Digital Technology in Architecture-I		
Course Type:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	<input type="checkbox"/> Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Develop a basic understanding of use of digital technologies associated with, but not limited to, parametric and design modeling, and, robotics in architecture as an aid to an interactive design process and representation
- Comprehend the digital fabrication as new method to build.
- Explore the potential of using digital fabrication in creating architectural spaces.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction – <ul style="list-style-type: none"> • Overview of application of digital technologies like parametric and design modeling, robotics and building information modeling, etc • Understanding the basics of programming language (Python, Java and equivalent) used in digital fabrication 	10 hours
Unit-II	Learn the uses of programming language in architecture– <ul style="list-style-type: none"> • Domain & scope of script based design development • Learn to develop the scripts with the use of programming language to generate design. 	15 hours
Unit-III	Digital model to physical model – <ul style="list-style-type: none"> • Undertake a small project to explore the potential of the technology in creating architectural spaces. • Demonstrate the use of technology in synthesizing the process of Design, Analysis, Representation, Fabrication and Assembly. 	20 hours

Self Study:

Suggested List of Experiments:

Suggested Case List:

Suggested Readings/ References:

1. Braumann, J., Brell-Cokcan, S., Willette, A., McGee, W., & León, M. P. (2014). *Robotic fabrication in architecture, art and design 2014*. Berlin: Springer.
2. Adriaenssens, S. (2016). *Advances in architectural geometry 2016*. Zürich: Vdf Hochschulverlag AG an der ETH Zürich.
3. Beorkrem, C. (2013). *Material strategies in digital fabrication*. New York: Routledge, Taylor & Francis Group.
4. Gramazio, F., Kohler, M., Picon, A., Roche, F., & Verebes, T. (2014). *Made by robots: challenging architecture at a larger scale*. London: John Wiley & Sons.
5. Gramazio, F., & Kohler, M. (2014). *Fabricate: Negotiating Design and Making*. Zürich: Gta Verlag / Eth Zürich.
6. Naboni, R., & Paoletti, I. (2015). *Advanced customization in architectural design and construction*. Cham: Springer.
7. Pell, B. (2010). *The articulate surface: ornament and technology in contemporary architecture*. Basel: Birkhäuser.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AR567		
Course Title:	Related Study Programme (RSP)-IV		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	4

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 weeks (30 hours / week)

Total Teaching hours: 90 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals – <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	Compilation and documentation – <ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	30 hours

Institute Elective Courses (For Semester- V and VI)*:	
2AREA01	Leather craft
2AREA02	Pottery
2AREA03	Claywork/ Terracotta/ Ceramic
2AREA04	Furniture design
2AREA05	Performing Arts
2AREA06	Graphic Signage
2AREA07	Collages and Montages
2AREA08	Metal craft
2AREA09	Casting/ Moulding (Pop, Metal, resin, fiber)
2AREA10	Print (Lithography/ Linography/ Woodcut/ Metal print)
2AREA11	Colour in Architecture
2AREA12	Building Energy Modelling and simulation
2AREA13	Methods of Architectural documentation
2AREA14	Stage and set design
2AREA15	Art Appreciation
2AREA16	Creative writing
2AREA17	Film Appreciation
2AREA18	Journalism – An Introduction
2AREA19	Programming language – Fundamentals
2AREA20	Temporary structures
2AREA21	Bamboo construction
2AREA22	Bio-mimicry
2AREA23	M S Office
2AREA24	Building Information Modelling (BIM)
2AREA25	Structure-V
2AREA26	Caricature
2AREA27	Traditional Arts & Craft
2AREA28	Earthquake Resistant <i>Buildings</i>

NIRMA UNIVERSITY
INSTITUTE OF ARCHITECTURE & PLANNING
BACHELOR OF ARCHITECTURE
SEMESTER-V & VI
INSTITUTE ELECTIVE

ANNEXURE-I

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA01		
Course Title:	Leather Craft		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component			C
		LPW	PW	W	S
1				1	2

Course Learning Outcomes (CLO):

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

- Relate to the different types and forms of leathers and leather crafts.
- Develop a sense of different tools, techniques, material properties, material preparation, and finishing techniques involved in leather craft.
- Create a product or article of leather craft.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	INTRODUCTION TO LEATHER WORK <ul style="list-style-type: none"> • Rationale for Studying Leather work • Places of Leather • Classification of Leather work • Careers in Leather work 	6 hours
Unit-II	BASIC TOOLS AND MATERIALS IN LEATHERWORK <ul style="list-style-type: none"> • Identification and Preparation of Leather work Tools • Leather-Raw Materials and Preparation • Other Leather work Materials • Maintaining a Healthy Environment 	6 hours

Unit-III	PRODUCTION OF LEATHER ARTICLES	3 hours
	<ul style="list-style-type: none"> • Design Environment • Preliminary Design • Design Process • Making Leather Items • Appreciation Criticism and Judgment 	
Unit-IV	LEATHER DECORATION AND FINISHING I	6 hours
	<ul style="list-style-type: none"> • Leather Decoration • Leather Finishing 	
Unit-V	ADVANCE TOOLS AND MATERIALS IN LEATHERWORK	3 hours
	<ul style="list-style-type: none"> • Identification of Tools and Materials in Leather work • Characteristics of Leather 	
Unit-VI	EXHIBITION OF LEATHER PRODUCTS	6 hours
	<ul style="list-style-type: none"> • Meaning, Types and Importance of Exhibition • Planning and Preparing the Exhibition • Mounting the Exhibition • Terms Used in Leather work 	

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA02		
Course Title:	Pottery		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	1	-	2

Course Learning Outcomes (CLO):

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

- Relate to different types and forms of clay, clay work, and pots.
- Illustrate the use of a potter's wheel.
- Apply the basic knowledge of working with clay and tools in designing a product.
- Create a product with finishing with hands-on working on the potter's wheel.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
UNIT-I	Introduction to mud and mirror work <ul style="list-style-type: none"> • Basic rules& principles • Mud and Mirror Work (also known as Lippan Kaam) is a traditional mural craft of Kutch. • Clay and dried donkey dung powder is mixed together in almost equal proportions to make a thin slurry. This slurry is applied as the base of the artwork. 	6 hours
UNIT-II	Making Geometrical Design , and Tracing on MDR Making Dough. <ul style="list-style-type: none"> • Mike en Place or "everything in its place". ... • Mixing. ... • Bulk (Primary) Fermentation. ... • Punching Down. ... • Benching. ... • Shaping and Panning the Loaves. ... • Proofing the Loaf (Secondary Fermentation) ... Step 10: Stage 10: Baking.	6 Hours

UNIT-III	<p>Tools and Raw Materials</p> <ul style="list-style-type: none"> • The tools and raw materials used • Wooden board/ Hardboard • Clay,Glue,Chalk Powder,Sawdust, • Scale,Pencil,Frame,Color,Mirror,Waste Cloth 	3 hours
UNIT-IV	<p>Learning Different Architectural patterns in mud-work</p> <ul style="list-style-type: none"> • Design pattern Architectural Patterns • Design frame work, • Design Plywood /hardboard • Design is drawn on the wooden piece using pencil 	6 hours
UNIT-V	<p>Kneading clay and making dough and making pinching exercise</p> <ul style="list-style-type: none"> • Squeezing and kneading • Poking and pinching • Rolling , Pressing ,Cutting • Stamping ,Constructing • Imagining <p>Plasticine or modelling clay</p>	6 hours
UNIT-VI	<p>Hands on potter wheel making post/vases</p> <ul style="list-style-type: none"> • Lubrication Is Vital while Throwing • The Proper Method for Centering Clay on the Potter's Wheel. • Speed and Movement While Throwing. • Compress the Pot's Rim after Every Throw • The Mechanics of Throwing a Pot's Walls • Sponge Up Excess Liquid after Each Throw <p>Third Throw of the Pot's Walls</p>	3 hours

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA03		
Course Title:	Clay work / Terracotta/ Ceramics		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to different types and forms of clay, clay work, and pots.
- Relate to the different types of terracotta products and their production methods.
- Illustrate the knowledge of the processes involved in preparation and finishing of terracotta tiles and products.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching Hours
UNIT-I	Introduction Clay work / Terracotta <ul style="list-style-type: none"> • Introduction to structural clay products 	6 hours
UNIT-II	Basic tools Terracotta Clay <ul style="list-style-type: none"> • Types of terracotta. • Building bricks, roofing tiles & hollow Bricks • Raw materials used for body preparation General properties shape, colour, strength, resistance to weathering and colour on firing • Specification and tests of terracotta products 	6 hours
UNIT-III	Method of Manufacture of Terra Cotta Products <ul style="list-style-type: none"> • Method of manufacture for common building bricks, face bricks, blue bricks, paving bricks, sand lime bricks, Method of aging, pugging and souring, Various methods of shaping. • Manufacture of tiles such as roofing tiles, drain tiles, hollow tiles, etc. • Methods of drying of products and firing techniques • Kilns used for firing terracotta products 	3 hours

UNIT-IV	<p>Sanitary Wares</p> <ul style="list-style-type: none"> • Types of sanitary wares, earthenwares and stoneware sanitary wares, Details of fire clay sanitary wares and vitreous sanitary wares. • Raw materials used for manufacture of fire claysanitary wares, earthenware and vitreous sanitary wares. 	6 hours
UNIT-V	<p>Defects and Remedies</p> <ul style="list-style-type: none"> • Defects occurred in various types of traditional ceramics such as Pinholes, bubbles, cracks, bloating, crawling, rolling of glaze, spinouts, crazing and Denting etc. • Remedies of various defects Occurring in various types of traditional ceramics 	3 hours
UNIT-VI	<p>Tiles</p> <ul style="list-style-type: none"> • Various tiles: • wall ,floor, Porcelain and vitrified tiles • Introduction of tiles, • Manuf acture process of various tiles. • Raw materials used for various tiles. • Method of body preparation for various Tiles. <p>Methods of shaping of various tiles</p>	6 hours

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA04		
Course Title:	Furniture Design		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component			C
		LPW	PW	W S	
1				1	2

Course Learning Outcomes (CLO):

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

- Relate Furniture Design with respect to ergonomics, aesthetics, and construction joinery.
- Interpret the commercial / retail aspect of furniture design in the profession
- Illustrate the use of material and processes involved in preparation of a furniture
- Design and build a piece of furniture after preparing drawings and prototypes.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to fundamentals of Furniture Design <ul style="list-style-type: none"> • Different types of joints and joinery. • Examples of the usage of joints and joinery • Understanding details through drawings and measured drawings • Understanding joints: through preparation of dummy models • Field visit (optional) 	4 hours

Unit-II	Getting to know the Workshop <ul style="list-style-type: none"> • Introduction to workshop and equipment (Optional field visit) • Understanding machines • Preparation of joints in the workshop 	3 hours
Unit-III	Furniture Design: Design Development <ul style="list-style-type: none"> • Identifying the product to be constructed • Preparation of drawings • Resolving details • Preparation of Final Working Drawing 	4 hours
Unit-IV	Furniture Design: Ordering and preparing material <ul style="list-style-type: none"> • Calculation and estimation of the quantity of material required • Preparing material to be used for the identified product • Sizing of members 	3 hours
Unit-V	Furniture Design: Preparing the first model <ul style="list-style-type: none"> • Preparation of first prototype: Assembling the members with temporary joints 	8 hours
Unit-VI	Finalizing Design <ul style="list-style-type: none"> • Resolution of issues and queries and refining design • Preparation of the final product 	4 hours
Unit-VII	Finishes <ul style="list-style-type: none"> • Learning techniques used for finishing touches to product • Applying finishing touches on the product 	4 hours

Self Study:

- Suggested Readings/ References:
- Stem, Seth, *Designing Furniture from concept to shop drawing: a practical guide, A Fine Woodworking Book*. The Taunton Press, Newtown, CT, 1989
 - Lawson S (2013) *Furniture Design: An Introduction to Development, Materials and Manufacturing*, Laurence King Publishing Ltd
 - Boran S, Çavdar A, Barbu M (2013) *Evaluation of Bamboo as Furniture Material and Its Furniture Designs*. Pro Ligno
 - Graves, Garth (1997) *Woodworker's guide to furniture design : the complete reference for building furniture the right size, the right proportion and the right style*. Popular Woodworking Books (Ohio,Cincinnati etc)

- Nielson, Karla J. (2002) *Interiors : an introduction*. Taylor, David A.
- Rüegg, Arthur. (2012) *Le Corbusier: Furniture and Interiors 1905–1965*. Scheidegger & Spiess, Zurich, Switzerland

Suggested List of Experiments:
Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA05		
Course Title:	Performing Arts (Dance, Drama, Music)		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to various fields of performing arts.
- Identify the basic elements of dance, drama and music
- Take part in dance/music/drama performance

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching Hours
UNIT-I	Dance <ul style="list-style-type: none"> • Explore and communicate ideas, feelings and thoughts • The basic elements of dance: actions, dynamics, space, relationships, choreographic devices, introduction to contact, performance skills, choreographic skills and appreciation skills 	10 hours
UNIT-II	Drama <ul style="list-style-type: none"> • Explore a theme/topic/issue • Basic elements of drama and its vocabulary • Write reviews and develop an interesting script 	10 hours
UNIT-III	Music <ul style="list-style-type: none"> • Basic elements of music • Use different forms of music • Practical skills - new computer technology and keyboards, and will be encouraged to take part in group performances, both vocal and instrumental 	10 hours

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA06		
Course Title:	Graphic Signage		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Interpret the importance and relevance of Graphic Signages
- Illustrate the use of various techniques of typography
- Develop the knowledge of various compositions based on the typology.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
UNIT-I	History <ul style="list-style-type: none"> • Brief History of Signage 	3 hours
UNIT-II	Symbol, Signs & Pictograms	3 hours
UNIT-III	Principles s in graphic design <ul style="list-style-type: none"> • Principles of Compositions in graphic design and Detail • Importance of Visual Balance & colors in signage 	6 hours
UNIT-IV	Types of Signage <ul style="list-style-type: none"> • Different types of Signage – Indoor & Outdoor, 	3 hours
UNIT-V	Introduction Of graphic Software <ul style="list-style-type: none"> • I.E. Coral Draw, Adobe Photoshop, Adobe Illustrators, Lightroom (Over View And Biggnr Level Exploration) 	6 hours
UNIT-VI	Execution of Graphics <ul style="list-style-type: none"> • Introduction Of Printing or/and physically various method of execution of graphics 	9 hours

Self Study:

Suggested Readings/
References:

1. Rafael Concepcion (2018). Adobe Photoshop CC and Lightroom CC for Photographers Classroom in a Book, 2nd Edition, Adobe Press.
2. Meggs, P. B., Purvis, A. W., & Meggs, P. B. (2006). Meggs' history of graphic design. Hoboken, N.J: J. Wiley & Sons.
3. Cees W. de Jong, Alston W. Purvis, Jan Tholenaar (2019). Type: A Visual History of Typefaces and Graphic Styles, Taschen GmbH.-

Suggested List of

Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA07		
Course Title:	Collages & Montages		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Tell different types and techniques of collages and/or mantages
- Illustrate the importance of collages and/or montages as a tool to represent and communicate ideas
- Compose a collage/montage

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Brief History of collages & montages <ul style="list-style-type: none"> ● Brief Timeline, manual & digital ways, modern approaches etc 	4 hours
Unit-II	Different types of collages <ul style="list-style-type: none"> ● 2D Collages ● 3D Collages 	13 hours
Unit-III	Different types of Montages	13 hours

Self-Study:

- Suggested Readings/ References:
1. Simpson, L., & Alexander, E. (2018). Lorna Simpson collages. San Francisco: Chronicle Books.
 2. Moore, A. (2018). Collage Ideas Book. Octopus Publishing Group.
 3. Taylor, T., & Plowman, R. (2010). Masters: Collage: Major works by leading artists. New York: Lark Books.

Suggested List of Experiments: -

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA08		
Course Title:	Metal Craft		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to the different types of metal and metal crafts.
- Develop a sense of using different tools, techniques to work with metal
- Create a finished product or article of metal craft.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction <ul style="list-style-type: none"> • Introduction to different metals i.e. Iron, Steel, Aluminum, Copper, Bronze, Brass • Properties of different metals • Appropriateness of the metal for particular work 	3 hours
Unit-II	Metal and working technology <ul style="list-style-type: none"> • Learning different techniques required to work i.e. cutting, welding, bolting, riveting • Importance of the technique • Advantages and disadvantages of the techniques 	6 hours
Unit-III	Production <ul style="list-style-type: none"> • Design and make different objects from metal • Detail design • Precautions while making the object • Final finishes 	21 hours

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA09		
Course Title:	Casting / Molding (POP, metal, raisin, fiber)		
Course Type:		Core	Institute Elective
		Value Added Course	University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to different types of casting and molding methods, and their use in daily life.
- Illustrate the use of these methods
- Design and construct a finished piece of product using these techniques.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction and etiquette <ul style="list-style-type: none"> • Introduction • Discipline of the workspace and instruments of it 	3 hours
Unit-II	Importance <ul style="list-style-type: none"> • Understanding traditional ways of product making • Mass production by using molding and casting 	9 hours
Unit-III	Production <ul style="list-style-type: none"> • Design and make different objects by using the technique • Detail design • Precautions while making the object • Final finishes 	18 hours

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA10		
Course Title:	Print (Lithography / Linography / wood cut / metal print)		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Tell different types of prints and their roles importance
- Illustrate the methods of reproduction of the same artwork
- Design and construct a print using one/many methods and techniques

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction and etiquette <ul style="list-style-type: none"> • Introduction • Understand the discipline of the workspace and instruments 	3 hours
Unit-II	Importance <ul style="list-style-type: none"> • Traditional methods and importance • Understanding of different material • Different sizes and types of prints • Reproduction of print 	9 hours
Unit-III	Production <ul style="list-style-type: none"> • Prints from various methods and materials • Precautions while printing • Mass production of the print • Preservation of print materials 	18 hours

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA11		
Course Title:	Color in Architecture		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Define the role, importance, and impact of color in architecture
- Demonstrate color as a medium of sensory perception and its physiological, psychological effect in architecture.
- Analyze and explain the effect of different colors in design to create specific effects in spaces

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to Colour in Architecture <ul style="list-style-type: none"> • Understanding colour, colour wheel, and types of colour • Colour in architecture 	3 hours
Unit-II	Role of colour in Architecture Impact of colour in architecture <ul style="list-style-type: none"> • Theory and systems of using color in architecture • Role and effect of colour and texture in spaces • Colour Symbolism 	6 hours
Unit-III	Analysis of Space w.r.t. colour <ul style="list-style-type: none"> • Analysis of space using monochromatic or achromatic abstractions in 2-Dimension • Analysis / Difference in space using colour • Examining the difference in space with different colour 	6 hours
Unit-IV	Colour in Architecture as a Sensory Tool <ul style="list-style-type: none"> • Perception of colour in space • Architectural psychology • Visual Ergonomics • Psychosomatic 	8 hours

- Unit-V Color Psychology in spatial context 7 hours
- Behavior and effects of colour composition
 - Impression of colour and how it supports the function of a space

Self Study:

Suggested Readings/
References:

1. Holtzschue, Linda. (2017). *Understanding color : an introduction for designers*. John Wiley & Sons (New Jersey)
2. Chijiiwa, Hideaki. (1987). *Color harmony : a guide to creative color combinations*. Rockport Pub. Inc. (Massachusetts)
3. Gerritson, Frans. (1975). *Theory and practice of color : a color theory based on laws of perception*. Studio Vista Pub. (London)
4. Renner, Paul. (1964). *Color : order and harmony*. Reinhold Book Corp. (New York)
5. Feisner, Edith Anderson (2014). *Color studies*. Fairchild Books (New York)
6. Porter, Tom Ed. (2009). *Colour for architecture today*. Taylor & Francis (New York)

Suggested List of

Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA12		
Course Title:	Building Energy Modeling and Simulation		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Demonstrate understanding of range of building modeling and simulation approaches and tools
- Develop the understanding to construct simple models with tools commonly used in the building professions
- Apply models to common building industry functions such as code compliance and energy audits

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction of Energy Modeling <ul style="list-style-type: none"> • Brief of Building Energy Modeling and simulation 	3 hours
Unit-II	Principles <ul style="list-style-type: none"> • Principles of Building Energy Modeling and simulation and detail parameters 	3 hours
Unit-III	Organization reorganization in Building Energy <ul style="list-style-type: none"> • GHIRA, LEED Introduction and Type of Resignation and recognition by organization and examination 	6 hours
Unit-IV	Introduction of Building Energy Modeling and simulation Software <ul style="list-style-type: none"> • I.E. Honey bee, Autodesk Ecotech, Diva Rahino, Window (Glass Panel Energy), Laybug (any Chosen by appropriate resource and outcome) 	9 hours

Unit-V	Graph and Simulation	6 hours
	• Learning to read of graphs and Simulation	
Unit-VI	Site visit	3 hours

Self Study:

Suggested Readings/
References:

1. Managing Indoor Environments and Energy in Buildings with Integrated Intelligent Systems (Green Energy and Technology) by Triantafyllia Nikolaou (Author), Dionysia Kolokotsa (Author), George Stavrakakis (Author), Apostolos Apostolou (Author), Corneliu Munteanu (Author)
2. Energy Performance Modelling and Heat Recovery Efficiency Assessment Paperback – Import, 25 Sep 2015 by L Harmati Norbert (Author), Foli (Editor), Magyar Zoltan (Editor)
3. Data Mining and Machine Learning in Building Energy Analysis (Computer Engineering) 1st Editio by Frédéric Magoules (Author), Hai-Xiang Zhao (Author)
4. Building Energy Simulation: A Workbook Using DesignBuilder™ BY Vishal Garg, Jyotirmay Mathur, Surekha Tetali, Aviruch Bhatia
5. GHIRA, organization and examination handbook
6. LEED, organization and examination handbook

Suggested List of

Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA13		
Course Title:	Methods of Architectural Documentation		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Illustrate the use of various techniques of architectural documentation
- Demonstrate the skills and prepare the framework of an architectural documentation
- Create an architectural work portfolio

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to techniques of documentation <ul style="list-style-type: none"> • Written and visual documentation • Photographic documentation • Video documentation 	7 hours
Unit-II	Content writing and framework of a portfolio <ul style="list-style-type: none"> • How to create a content for making an effective portfolio? • Graphics and framework of a portfolio • Learn the skills required for making a portfolio 	10 hours
Unit-III	Portfolio <ul style="list-style-type: none"> • Compositions and layouts • Create a portfolio 	13 hours

Self Study: -
Suggested Readings/ References: -
Suggested List of Experiments: -
Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA14		
Course Title:	Stage & Set Design		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Interpret the script analysis techniques necessary to collect visual information required for the design
- Outline the various types of stage design
- Construct scaled ground plans, sectional drawings and construction drawings pertinent to a specified script and a particular stage type stated above
- Build a part or whole stage/set for a chosen script

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching Hours
Unit-I	How to think visually <ul style="list-style-type: none"> • Taking written ideas from a particular dramatic script and describing/curating them • Visual, physical and verbal representation of the idea 	6 hours
Unit-II	Understanding the theatre design process <ul style="list-style-type: none"> • Script - As the source for the design • Sketches & drawings -Demonstrating an initial visual design 	6 hours
Unit-III	Creating drawings <ul style="list-style-type: none"> • Scaled Drawings -Demonstrating the finished design via 2 dimensional medium • Models -Demonstrating the finished design via a 3 dimensional medium • Sections, Rendered sketches 	12 hours

Unit- Stage/set design 6 hours
IV • Practically create a stage / part of the stage/set as a group work

Self Study: -
Suggested Readings/ References: -
Suggested List of Experiments: -
Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA15		
Course Title:	Art Appreciation		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to different works of art
- Demonstrate the processes involved in artistic production
- Analyse and interpret the role and effect of arts in society, history and world culture

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to Art Appreciation <ul style="list-style-type: none"> • Explore the concept of art • Theories of art aesthetics and how to apply the to an artwork • Formal art criticism and will apply these steps to various artworks 	3 hours
Unit-II	Elements of Art <ul style="list-style-type: none"> • Elements of Art including: line, shape, form, value, color, space, and texture • Elements in a variety of artworks to increase fluency in artistic perception • Basic representations of the elements to develop confidence in creative expression 	3 hours

Unit-III	Principles of Design <ul style="list-style-type: none"> • Principles of Design including: balance, rhythm, movement, contrast, emphasis, and unity • Principles in a variety of artworks to increase their fluency in Artistic Perception • Basic representations of the elements to develop confidence in creative expression 	3 hours
Unit-IV	Art Making <ul style="list-style-type: none"> • Art making techniques of drawing, painting, sculpture, printmaking, and photography • Materials used and the techniques artists most often utilize in their artmaking • Understanding of the materials and methods of creative expression 	3 hours
Unit-V	Art History Early Civilizations <ul style="list-style-type: none"> • Art from the earliest known civilizations including rock/wall art, sculpture, and architecture • Artworks and architecture from Ancient Egypt, Ancient Greece, and Rome • Cultural background and context for a holistic understanding of the historical and cultural context of the selected pieces 	3 hours
Unit-VI	Early Christian to Gothic <ul style="list-style-type: none"> • Artworks and architecture from the Early Christian Era, Byzantine Era, and from Islamic cultures 	3 hours
Unit-VII	Renaissance to Rococo <ul style="list-style-type: none"> • Art of the Proto-Renaissance, Renaissance, Mannerism, Baroque, and Rococo eras, including major socio-political changes, artmaking differences, stylistic differences, and accompanying works • Shifts in medium (introduction of oil paints) and techniques (chiaroscuro and tenebrism) as part of their process of understanding the historical and cultural context of art 	3 hours
Unit-VIII	Early Modernism <ul style="list-style-type: none"> • Trace the changes in art through the following eras: Enlightenment, Neoclassical, Romanticism, Realism, Impressionism, Post-Impressionism, Symbolism, Expressionism, Cubism • Style of each era, the links to socio-political changes that influenced the era, and to describe representative artists and artworks from these eras 	3 hours

Unit-IX	Modernism <ul style="list-style-type: none"> • Work of Modernists, Dadaists, Abstract artists, Pop Art, Super-realists, and Contemporary Art • Develop art vocabulary to include terms such as chromatic abstraction, installation art, conceptual art, and more 	3 hours
Unit-X	Exploring World Art Artworks from Africa and Asia, including wall paintings, power figures, relic guards, and masks Asian artworks, including Buddhist and Hindu art such as architecture, sculpture, landscapes, ink paintings, and printmaking	3 hours

Self Study:

Suggested Readings/

References:

1. Carlson, Allen. Aesthetics and the environment : the appreciation of nature, art and architecture. Pt.1 : the appreciation of nature. Pt.2 : landscapes, art and architecture.. Routledge (London & New York). 2002.
2. Barlingay, S. S.. Modern introduction to Indian aesthetic theory. D.K. Printworld (P) Ltd (New Delhi), 2007.
3. Gauldie, Sinclair. Architecture : the appreciation of the arts. Oxford Uni. Press (Madras,Singapore etc). 1969.
4. Knobler, Nathan. Visual dialogue : an introduction to the appreciation of art. Holt, Rinehart & Winston (Toronto,New York etc). 1971.
5. Carroll, Noel; Paul K. Moser. Philosophy of art : a contemporary introduction. Routledge (London). 1999.

Suggested List of

Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA16		
Course Title:	Creative Writing		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Demonstrate ideas through writing
- Develop a final piece of work (story, poem or personal essay)
- Originate a platform to initiate further study in the field

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Basics of Creative expression <ul style="list-style-type: none"> • Discussion on the fundamentals of creative expression 	6 hours
Unit-II	Fundamentals of creative writing <ul style="list-style-type: none"> • Overview of texts fundamental to creative writing 	6 hours
Unit-III	Writing Techniques <ul style="list-style-type: none"> • Technique of writing, such as rhythm, metre, point of view, voice, narrative, pacing 	9 hours
Unit-IV	Modes of writing <ul style="list-style-type: none"> • Writing prompts to be able to write essays, stories, poems, figurative writing, persuasive writing, theme based writing, etc. 	9 hours

Self Study:

Suggested Readings/
References:

1. Ganguly, Subrata. Symbol, script and writing : (from petrogram to painting and further..). Sharada Publishing House (Delhi), 2004.
2. Morley, David. Cambridge introduction to creative writing. Cambridge Uni. Press (Delhi), 2010.
3. Ramadass, P.; Aruni, A. Wilson. Research and writing : across the disciplines. MJP Pub. (Chennai), 2009.
4. Shaw, Mark. Copywriting successful writing for design, advertising and marketing. Laurence King Publishing (London). 2012.
5. Schmalz, Bill. Architect's guide to writing. Images Pub. Group Pty Ltd. (Victoria). 2014.

Suggested List of

Experiments:

Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA17		
Course Title:	Film Appreciation		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Take part in active viewing of cinema and develop one's own informed perspective through personal engagement with films using analytical tools and techniques
- Analyse that content, form, and contexts work together to create meaning in the film
- Adapt to using the key concepts, models and tools used in film criticism

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching Hours
Unit-I	Film vs. Theatre <ul style="list-style-type: none"> • Differences and similarities between film and theatre • Stage vs. screen 	3 hours
Unit-II	Films <ul style="list-style-type: none"> • Types of films • Timeline of film making – black and white to 3D experience 	6 hours
Unit-III	Movies for Fun & Profit, Art & Communication <ul style="list-style-type: none"> • Movies and their roles in our lives • Film: looking for meaning • From theaters to Netflix to iPhones • The current film landscape 	6 hours
Unit-IV	Film and Its Impact on Society <ul style="list-style-type: none"> • Films beyond just entertainment • Pushing the envelope: Case studies 	9 hours

Unit-V Criticism and Analysis

6 hours

What is a critic?

- Approaches to analysis and interpretation

Self Study: -

Suggested Readings/ References: -

Suggested List of Experiments: -

Suggested Case List: -

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA18		
Course Title:	Journalism- An introduction		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Apply the concept of journalism in the field of Architecture
- Appraise the role of architectural journalism in identifying and formulating relevant buildings
- Develop the capacity to write critics on selected projects

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to Journalism	6 hours
	• Concept of Journalism, Definition, History	
Unit-II	Fundamentals of Journalism	12 hours
	• Advantages of Journalism, concept of Ethical journalism, Journalism in design field	
Unit-III	Role of Journalism in general & in design field	12 hours
	• Case Studies –Global & Local, Short Project	

Self-Study:

Suggested

Readings/

References:

1. Al-Asad, M., & Musa, M. (2006). Architectural criticism and journalism: global perspectives: proceedings of an international seminar organised by the Aga Khan Award for Architecture in association with the Kuwait Society of Engineers, 6-7 December 2005, Kuwait. Turin, Italy: Umberto Allemandi & C. for Aga Khan Award for Architecture.
2. Allan, S. (2010). The Routledge companion to news and journalism. New York, NY: Routledge.
3. Booth, G. G. (1918). The spirit of journalism and architecture. Place of publication not identified.
4. Franklin, B. (2005). Key concepts in journalism studies. London: SAGE
5. Harcup, T. (2004). Who, what, where, when, why and how?: an introduction to journalism. London: Sage.
6. Willis, J. (1990). Journalism: state of the art. New York: Praeger.
7. LEED, organization and examination handbook

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA19		
Course Title:	Programming Language - Fundamentals		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to the concepts that underlie programming languages
- Illustrate how computer applications work and will be able to write their own application
- Utilize the application this knowledge to the field of architecture

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction Of Programming Brief Of Programming	6 hours
Unit-II	Choose the right language Introduction of various language in programming and choose form one of it.	6 hours
Unit-III	Language introduction Introduction in particular language	6 hours
Unit-IV	Architecture Modeling/ Simulation/Design / Data Mining Application in Architecture	12 hours

Self Study:

Suggested Readings/
References:

1. Processing: A Programming Handbook for Visual Designers, Second Edition; Casey Reas and Ben Fry.
2. Generative Design; Hartmut Bohnacker, Benedikt Gross, Julia Laub, and Claudius Lazzeroni.
3. Processing: Creative Coding and Generative Art in Processing 2; Ira Greenberg, Dianna Xu, Deepak Kumar.
4. Urban Algorithms for Visual Design Using the Processing Language; Kostas Terzidis.

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA20		
Course Title:	Temporary Structures		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to different types of “temporary structures”.
- Identify the requirements and importance of the “temporary structures”
- Analyze aspects, issues to design “temporary structures”

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction What is a temporary building and what are its requirements?	10 hours
Unit-II	Requirements and importance Requirement of temporary structure with respect to Place, environment, social and cultural dimensions as a designer	10 hours
Unit-III	Methodology and construction Various techniques for design and construction of temporary buildings.	10 hours

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA21		
Course Title:	Bamboo construction		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Relate to “Bamboo” as a material and different types of “Bamboo” and their qualities.
- Interpret the importance of bamboo as construction material.
- Apply different construction techniques using bamboo as a construction material.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction <ul style="list-style-type: none"> • Bamboo as a building material and its different types. • Qualities and properties of different types of Bamboo as a construction material. 	10 hours
Unit-II	Design and construction methodology. (Part 1) <ul style="list-style-type: none"> • Designing with bamboo. • Applying the proper construction methodologies for the task at hand. 	10 hours
Unit-III	Design and construction methodology. (Part 2) <ul style="list-style-type: none"> • Solving problems as they arise • Setting priorities and keeping work on schedule. 	10 hours

Self Study:
Suggested
Readings/
References:

1. Traditional bamboo housing in Asia.
2. Mari Tanaka, Daisuke Niwa, Naohiko Yamamoto and Shuji Funo,
Bamboo as a Building Material in Japan : Transition and Contemporary use.
3. H.N. Jagadeesh and P.M. Ganapathy ,Traditional Bamboo-based Walling/Flooring Systems in Buildings and Research Needs.
Karen Edwards and Heny Doing, The Importance of Bamboo and Housing Construction : A Case Study in Flores.
4. Oscar Arce, Bamboo Housing in Seismic-prone Areas/
5. Emmanuel D. Bello and Florence Pascua-Soriano,
Typhoon-resistant Bamboo Housing in the Philippines.
6. Purwito, The Application of Bamboo for Earthquake-resistant Houses.
7. Oscar Hidalgo , Study of Mechanical Properties of Bamboo and its use as Concrete Reinforcement : Problems and Solutions

Suggested List of
Experiments:
Suggested Case
List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA22		
Course Title:	Bio-Mimicry		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

At the end of the course, students will be able to: –

- Relate to Bio-mimetic approaches to design
- Illustrate Nature inspired design thinking.
- Identify sustainable solutions to human’s problem by mimicking and emulating nature in its analogies, phenomenon and patterns.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit -I	Observe and understand nature's designs, process, systems, strategies and mechanisms <ul style="list-style-type: none"> • Origins of patterns and shapes • Shapes and their causes • Self assembly and self organisation • Emergence: spatial or spacio-temporal structures • Fractal shapes • Morphosyntactic processes in nature • Form, efficiency and ecology • Bio-inspired technologies: locomotion, construction, structural materials, surfaces, optics, etc 	10 hours
Unit -II	Bio-mimetic approaches to design <ul style="list-style-type: none"> • Design looking to biology (Top-Down approach) • Biology influencing design (Bottom-Up approach) • Three levels of mimicry: the organism level, behavior level and ecosystem level • Understand principles and processes in bio-mimesis 	10 hours

- Unit -III** Application of nature inspired design thinking and innovation 10 hours
- Bio-inspired structure and construction, Minimal surfaces, Architectural interpretation, Geometry and computation
 - Explore design method and techniques to apply bio-mimetic concepts

Self Study:
Suggested
Readings/
References:

1. Macnab, M. (2012). *Design by nature: Using universal forms and principles in design*. Berkeley: New Riders.
2. Chaplain, M. A. J., McLachlan, J. C., & Gurdev, S. (1999). *On growth and form: Spatio-temporal pattern formation in biology*. New York: Wiley.
3. Thompson, D. A. W. (1968). *On growth and form: Vol. 1*. Cambridge: Cambridge University Press.
4. Thompson, D. A. W. (1979). *On Growth and form: 2*. Cambridge: Univ. Pr.
5. Kapsali, V. (2016). *Biomimicry for designers: Applying nature's processes and materials in the real world*. New York, New York : Thames & Hudson.
6. Vogel, S. (2018). *Why the wheel is round: Muscles, technology, and how we make things move*.
7. Vogel, S. (2000). *Cats' paws and catapults: Mechanical worlds of nature and people*. New York: Norton.
8. Benyus, J. M. (2009). *Biomimicry: Innovation inspired by nature*. New York, NY: Perennial.
9. Pawlyn, M. (2016). *Biomimicry in architecture*. Newcastle upon Tyne: Riba Publishing

Suggested List of
Experiments:
Suggested Case
List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA23		
Course Title:	MS office		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Find out about using word, power point, excel and other related software
- Find out about various aspects, use of software in professional manner
- Demonstrate the use MS Office as a holistic software.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Getting started <ul style="list-style-type: none"> • The Word/power point/Excel window • New documents • Document navigation 	3 hours
Unit-II	Editing <ul style="list-style-type: none"> • Working with text • The Undo and Redo commands • Cut, copy, and paste, Find and replace 	3 hours
Unit-III	Text formatting <ul style="list-style-type: none"> • Character formatting • Tab settings • Paragraph formatting, Paragraph spacing and indents 	6 hours
Unit-IV	Tables <ul style="list-style-type: none"> • Creating tables • Working with table content • Changing the table structure 	3 hours
Unit-V	Page layout <ul style="list-style-type: none"> • Headers and footers, Page setup 	6 hours

Unit-VI	Graphics	3 hours
	<ul style="list-style-type: none"> • Adding graphics and clip art • Working with graphics 	
Unit-VII	Proofing, printing, and exporting	6 hours
	<ul style="list-style-type: none"> • Spelling and grammar, AutoCorrect • Printing and exporting documents 	

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA24		
Course Title:	Building Information Modelling		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Demonstrate the multi-disciplinary coordination (Architecture, MEP, Structure, Landscape, etc.)
- Apply the skills to improve presentation of drawings
- Create the design in a BIM software and generate working drawings

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Overview of BIM Technology <ul style="list-style-type: none"> • What is BIM? • Introduction: History: BIM vs. Geometric Modeling Elements of BIM 	3 hours
Unit-II	Application of BIM Software <ul style="list-style-type: none"> • Management of building information models • BIM in construction management • BIM in facility operation • BIM in green building 	3 hours
Unit-III	Basic modelling <ul style="list-style-type: none"> • Introduction to Building Information- Modelling –BIM and Revit- User interface – Levels- Grids & Columns – Walls – Doors – Windows – Floors – Stairs – Ceilings – Roofs – Sections - Elevations 	10 hours

- Unit-IV** Extended modelling and outputs 7 hours
- Curtain walling - 3d views - Rendered outputs - Schedules - Families (basic content creation)- Details & Callouts - Linked files - Layouts & Plotting
- Unit-V** Conceptual modelling Collaboration & Analysis 7 hours
- Organic conceptual modelling - Linking to other modelling software - Collaboration - BIM Analysis

Self Study:
Suggested Readings/
References:

- Garber, Richard. (2014). BIM Design: Realising the Creative Potential of Building Information Modelling. Wiley. 1 edition.
- Kensek, Karen M. Noble, Douglas E. (2014). Building Information Modeling: BIM in Current and Future Practice. Wiley..
- Eastman, Chuck. Teicholz, Paul. Sacks, Rafael. Liston, Kathleen (2011) BIM Handbook : A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. John Wiley & Sons.
- Briscoe, Danelle. (2015) Beyond BIM : Architecture Information Modeling. London Routledge Taylor and Francis Group.

Suggested List of Experiments:
Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA25		
Course Title:	Structure-V		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Develop advances in technology and Structural understanding at higher level of complexity
- Learning of understand system of re-stressed concrete construction
- Develop understanding between light weight structure and surface Structures

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Structural concept of folded plate, shells, hyperbolic and paraboloid forms <ul style="list-style-type: none"> • Introduction of advanced structural systems • Concept and analysis of advanced structural system 	12 hours
Unit-II	Behavior and systems of prestressed concrete construction <ul style="list-style-type: none"> • Concept and analysis of Prestressed concrete system 	6 hours
Unit-III	Prefabrication in Steel/RCC <ul style="list-style-type: none"> • Detail understating of prefabrication in steel and RCC 	6 hours
Unit-IV	Lightweight and Surface structures <ul style="list-style-type: none"> • Difference between light weight and Surface structure. • Concept and analysis of light weight and Surface Structure Structure 	6 hours

Self-Study:
Suggested
Readings/
References:

1. Hibbeler, Russell C., Structural Analysis, India, Pearson Education Asia Pte. Ltd., 2013
2. Pandit, G. S., Structural Analysis: A Matrix Approach, New Delhi, Tata McGraw-Hill Publishing Company Ltd., 2008
3. Charleson, Andrew., Structure as architecture : Source book for architects and structural engineers, London, Taylor & Francis, 2015
4. Bali, N. P., Textbook of Engineering Mathematics, New Delhi, Laxmi Publications Pvt. Ltd., 2011
5. Ramamrutham, S., Theory of Structures, Delhi, Dhanpat Rai & Sons, 2013
6. Kumar, Ashok, Theory of Structures, New Delhi, Laxmi Publications Pvt. Ltd., 2004
7. Parikh, Janak, Understanding Concept of Structural Analysis and Design, Anand, Charotar Publishing House
8. Levy, Matthys, Why Buildings Fall Down: How Structures Fail, New York, W. W. Norton and Co., 2002
9. Schodek, Daniel L. Structures. Englewood Cliffs, NJ: Prentice-Hall, 1980. Print.
10. Millais, Malcolm. Building Structures: From Concepts to Design. London: Spon, 2005. Print.
11. Corkill, P. A., H. L. Puderbaugh, and H. K. Sawyers. Structure and Architectural Design. Iowa City: Sernoll, 1974. Print.
12. Ambrose, James E. Building Structures. New York: Wiley, 1988. Print.
13. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
14. SP – 16, Design Aids for Reinforced Concrete to IS 456
15. National Building Code of India, 1983
16. IS 1905, Code of Practice for Structural Safety of Buildings.

Suggested List of
Experiments:
Suggested Case
List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA26		
Course Title:	Caricature		
Course Type:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Learn the history of caricature
- Understand the techniques of making caricatures
- Develop analytical skills and different techniques

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Introduction to Caricature – <ul style="list-style-type: none"> • Brief History of caricatures • Uses and applications of caricatures in design field 	10 hours
Unit-II	Caricature and object – Introduction to object and associating meanings with abstraction, anatomy, materials, elements of face, and, deformation & stylization <ul style="list-style-type: none"> • Caricatures of objects, animals • Caricature of person 	20 hours

Self-Study:

Suggested Readings/
References:

Suggested List of
Experiments:
Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA27		
Course Title:	Traditional Arts & Craft		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component			C
		LPW	PW	W	
1				1	2

Course Learning Outcomes (CLO):

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

- Learn about the field of Art and Craft from a traditional point of view
- Learn culture and heritage of vernacular arts and craft
- Interpret a work of art and craft

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Traditional Arts and Crafts theories and its chronological history – <ul style="list-style-type: none"> • Overview of the theories prevalent in Traditional Arts and Craft • To Identify, map, document and analyze Traditional & Vernacular Building (TVB) and Space Making Crafts (SMCs) & Space Surface Crafts (SSCs). And to conduct research and analysis of craftspeople, craft communities and clusters related to building sector • Chronological history of Traditional Art and Craft (India and Abroad) 	10 hours
Unit-II	Application of arts and crafts in the field and understanding the relation between culture, society and crafts – <ul style="list-style-type: none"> • Application of selected Arts and crafts in different industry • Develop understanding about the field through hands on workshops 	20 hours

- Exposure to other cultures have greatly influenced the traditions and culture of the different regions

Self-Study:

Suggested Readings/
References:

1. Carlson, Allen. Aesthetics and the environment : the appreciation of nature, art and architecture. Pt.1 : the appreciation of nature. Pt.2 : landscapes, art and architecture.. Routledge (London & New York). 2002.
2. Barlingay, S. S.. Modern introduction to Indian aesthetic theory. D.K. Printworld (P) Ltd (New Delhi), 2007.
3. Gauldie, Sinclair. Architecture : the appreciation of the arts. Oxford Uni. Press (Madras,Singapore etc). 1969.
4. Knobler, Nathan. Visual dialogue : an introduction to the appreciation of art. Holt, Rinehart & Winston (Toronto,New York etc). 1971.

Carroll, Noel; Paul K. Moser. Philosophy of art : a contemporary introduction. Routledge (London). 1999.

Suggested List of Experiments:
Suggested Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA28		
Course Title:	Earthquake resistance buildings		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
Year of introduction:	2021		

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
1				1		2

Course Learning Outcomes (CLO):

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

- Develop understanding about “seismology” in the built-environment
- Learn various aspects, issues of “Earthquake resistant design”.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hr

Unit	Syllabus	Teaching Hours
Unit-I	Semiology in built-environment – <ul style="list-style-type: none"> • Introduction To Seismology - Historical occurrences, earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India & and the world. How earthquakes are caused - seismic waves, magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions. Impact of Earthquake - on ground, soil rupture, liquefaction, landslides and social & economic consequences. 	10 hours
Unit-II	Earthquake resistant design of masonry buildings – Study of behaviors of various types of buildings, lifelines and collapse patterns at earthquake (torsion, appendages, staircases, adjacency, pounding). <ul style="list-style-type: none"> • Structural and architectural aspects of earthquake resistant design 	10 hours

- Unit-III Seismic principles, design and structural dynamics – 10 hours
- Seismic design philosophy, Step by step procedure for seismic analysis of RC buildings
 - Earthquake resistant design of RC Buildings
Ductile detailing considerations as per 13920: 1993
 - Structural Dynamics

Self-Study:

Suggested Readings/
References:

1. Arnold, C. "Architectural Aspects of Seismic Resistant Design", Paper 2003, Eleventh World Conference on Earthquake Engineering, Elsevier Science Ltd., 1996.
2. Charleson A.W. and Taylor M. "Towards an earthquake architecture", Proceedings 12th World Conference on Earthquake Engineering January 2000, NZ National Society for Earthquake Engineering, Paper 0858, 2000.
3. Balmond, C., "informal", Prestel, Munich, 2002
4. Charleson, A.W. "Vertical Lateral Load Resisting Elements for Low to Medium-rise Buildings - Information for Architects", Bulletin of the New Zealand National Society for Earthquake Engineering, Vol. 26, No.3, 1993, pp. 356-366.
6. Arnold, C and Reitherman, R.K.(1982), Building Configuration and Seismic Design, John Wiley and Sons, New York
7. Naeim, F. ed. (1989), The Seismic Design Handbook, Van Nostrand Reinhold, New York
8. Willis, C. (1995). Form Follows Finance, Princeton Architectural Press, New York

Suggested List of Experiments:
Suggested Case List:

NU/AC/AC-301121/8(A)/22- 154
Date: 25.01.2022



NOTIFICATION

- Read:
1. R-44 – Empowering the Academic Council to approve Teaching & Examination Scheme, Syllabi, etc published vide notification No. NU-442 dated 27.01.2004
 2. Notification No. NU-80 dated 21.09.2021 - Revision in Teaching & Examination Scheme and Syllabi of Semester-I and II of B.Arch. programme in suppression of existing curricula
 3. Notification No. NU-81 dated 21.09.2021 - Revision in Teaching & Examination Scheme and Syllabi of Semester-III and V of B.Arch. programme by way of replacing with new courses and revision in the existing courses
 4. Resolution No. 3(i)(a) – Faculty of Architecture & Planning meeting – 27.10.2021
 5. Resolution No. 8(A) – Academic Council meeting – 30.11.2021
 6. Approval of Director General on note-dated 23.12.2021

Sub: Revision in curricula of Semester-IV and VI of B.Arch. programme in supersession of existing curricula

It is hereby notified for information of all concerned that the Academic Council in its meeting held on 30.11.2021 under resolution No. 8(A) in exercise of powers referred at serial 1 above and taking into consideration the recommendations of the Faculty of Architecture & Planning, has resolved to approve the revision in the curricula of Semester-IV and VI of **B.Arch.** programme by way of introduction of following new courses along with revision in the Syllabi of the existing courses in supersession of existing curricula as per new guidelines of Council of Architecture, to be made effective for the students to be registered in the respective semesters in academic year 2021-22 onwards:

Semester-IV

Introduction as Core course:

- i. Building Information Modelling

Revision in syllabi:

- i. Architectural Design Studio – IV
- ii. History & Theory – IV
- iii. Building Construction & Technology – IV
- iv. Structure – IV
- v. Environmental Science & Services–II
- vi. Introduction to Housing

Semester-VI

Introduction of new courses:

- i. Environmental Design and GIS Application
- ii. Development Control Regulation

Revision in syllabi:

- i. Architectural Design Studio – VI
- ii. History & Theory – VI
- iii. Building Construction & Services

It is further notified that the Director General was authorized to approve the revised document incorporating the suggestions made by the Academic Council and the final document as approved by the Director General is attached herewith as **Appendix-A**.

Executive Registrar

Encl.: Appendix-A [Pages 1 to 59]

To,

1. Dean, Faculty of Architecture & Planning
2. Academic Coordinator
3. Dy. Registrar (Exam)

Copy to,

1. Exam Sec.
2. OS
3. Library
4. P.A. to ER

c.f.w.cs to: Director General

NIRMA UNIVERSITY INSTITUTE OF ARCHITECTURE and PLANNING									
TEACHING AND EXAMINATION SCHEME FOR SEMESTER IV – (A.Y.2021-22)									
Name of the Programme: Bachelor of Architecture (B.Arch)									
Course Code	Name of the Course	SEMESTER IV Teaching Scheme				Scheme of Examination			
		Hours/Week			Credit	Hours	Component Weightage		
		L	W	S	C	SEE	SEE	CE	LPW
CORE COURSES									
2AR481	Architectural Design Studio - IV	-	-	12	12	-	-	0.5	0.5
2AR482	History & Theory - IV	2	-	-	2	3	0.3	0.5	0.2
2AR483	Building Construction & Technology - IV	2	2	-	4	3	0.3	0.5	0.2
2AR484	Building Information Modelling	-	3	-	3	-	-	0.5	0.5
2AR485	Structure - IV	1	2	-	3	3	0.3	0.5	0.2
2AR486	Environmental Science & Services - II	1	1	-	2	3	0.3	0.5	0.2
2AR487	Introduction to housing	1	1	-	2	-	-	0.5	0.5
2AR488#	Related Study Programme - III#	-	-	-	3#	-	-	-	1
No Elective will be offered in this semester									
SUPPLEMENTARY COURSES/ VALUE ADDED COURSES									
2ARS401	Social Work	-	2	-	-	-	-	-	1
Yet to be decided	Value Added Course*	-	2	-	-	-	-	-	1
Total		7	13	12	28/ 31\$	-	-	-	-
<p># 3 RSP and 1 Field Studio is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed upto Semester VII and remaining 1 RSP up to Semester X. And 1 Field Studio needs to be completed between Semester-V to X. Credit of RSP or Field Studio will be given to students based on their registration in the respective semester * Value Added courses offered in respective semester as offered by the Dean, FoAP,IAP,NU (As per attached Annexure-C)</p>									
<p>L: Lecture T: Tutorial P: Practical W: Workshop S: Studio C: Credit CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination</p>									
Supplementary Courses:									
1. Social Work		2. Value Added Course							

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR481
Course Title:	Architectural Design Studio - IV
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	12	12

Course Learning Outcomes (CLO):

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

- Interpret Environmental, Cultural and Place Dimensions of Space
- Explore the design at building element level, building level, cluster level and site level
- Demonstrate connection between the build space and natural evolved space to convert into comprehensive livable environment.

Syllabus: 15 weeks (12 hours/week)

Total Teaching hours: 180 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Preparatory exercises/ Programmatic and site analysis – <ul style="list-style-type: none"> • Factors affecting house form <ul style="list-style-type: none"> ○ Climate ○ Topography ○ Social and economic aspect ○ Temporary (Nomadic) and permanent (Settler) house structure • Traditional settlement (settler) <ul style="list-style-type: none"> ○ Community based ○ Security based ○ Income based ○ Climatic and topographic conditions • Temporary settlement (Nomadic) <ul style="list-style-type: none"> ○ Community based ○ Security based ○ Income based ○ Climatic and topographic conditions • Site Analysis <ul style="list-style-type: none"> ○ Site location or context (Inside city/outside city) ○ Culture and Socio-economic condition ○ Climate and Topography 	25 hours

- Built/open relation
 - Distribution of open space/green space
- Unit-II Conceptual stage and Schematic design – 35 hours
- Concept of Mass housing**
- Type of housing
 - Private housing
 - Public housing
 - Socio-economic condition
 - Income based
 - Low income
 - Middle income
 - High income
 - Community/socioeconomic based
 - Public participation
 - Construction technology based
 - Different type of concepts on housing in present
 - Student housing
 - Old people housing
 - Green building
 - Sustainability
- Unit-III Preliminary design to Design development – 65 hours
- Typology of Mass housing
 - Income based
 - Community based
 - Climatic and topographic conditions
 - Typology of house form – Low-rise housing, Midrise housing, High-rise housing, Mix use housing
 - Scale of housing
 - Cluster
 - Neighborhood
 - Sector
 - Block
 - City
- Unit-IV Design Resolution with Synthesis of design parameters – 55 hours
- Typology of Mass housing
 - Income based
 - Community based
 - Climatic and topographic conditions
 - Typology of house form – Low-rise housing, Midrise housing, High-rise housing, Mix use housing
 - Scale of housing
 - Cluster
 - Neighborhood
 - Sector
 - Block
 - City

Suggested Readings/
References:

1. Leupen, Bernard, and Harald Mooij. *Housing Design: a Manual*. NAI Uitgevers, 2018.
2. Habraken, N. J., and Jonathan Teicher. *Supports: an Alternative to Mass Housing*. Urban International Press, 2011.
3. Bosma, Koos, et al. *Housing for the Millions: John Habraken and the SAR (1960-2000)*. NAI Publishers, 2000.
4. White, Edward T. *Site Analysis: Diagramming Information for Architectural Design*. ArchiBasX Press, 2013.
5. Correa, Charles. *Charles Correa Housing and Urbanisation*. Thames & Hudson, 2000.
6. Rybczynski, Witold. *How the Other Half Builds*. Vol. 1: *Space*, Centre for Minimum Cost Housing, 1984.
7. Barquin, Carlos. *How the Other Half Builds*. Vol. 2: *Plots*, Centre for Minimum Cost Housing, McGill University, 1986.
8. Bhatt, Vikram. *How the Other Half Builds*. Vol. 3: *Self-Selection Process*, Centre for Minimum Cost Housing, McGill University, 1990.
9. Wates, Nick, and Jeremy Brook. *The Community Planning Handbook: How People Can Shape Their Cities, Towns, and Villages in Any Part of the World*. Earthscan from Routledge, 2017.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR482
Course Title:	History & Theory - IV
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Demonstrate an understanding of different styles of Indian architecture
- Compare between prominent/important historic buildings by their style of design of the Asian world.
- Formulate the contributing factors of the design development of different styles.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Vedic Era – <ul style="list-style-type: none"> • Introduction to Vedic era, society and culture, later Vedic era; janapadas, rise of mahajanapadas, Magadha • Jainism and Buddhism : Introduction to new religion and ideas 	4 hours
Unit-II	Mauryan, Chalukyan and Harshvardhan era – <ul style="list-style-type: none"> • Introduction to Mauryan empire, life and culture, important rulers • Western Chalukyan architecture, and Badami Chalukyan Architecture • Introduction to Gupta empire, life and culture, important rulers, life and culture. • Harshvardhana Era: Introduction to new religion and ideas • Rock cut architecture of the era 	8 hours
Unit-III	Islam and India – <ul style="list-style-type: none"> • Islamic Architecture: Introduction to Islamic culture worldwide; early Islamic architectural in India beginnings under the slave kings (cir. A.D. 1200 to 1290), The Sayyid (1414-51) and the Lodi (1451-1526) dynasties, Provincial styles (Bengal, Gujarat, Malwa, Deccan, Sasaram). 	10 hours

Handwritten signature

- Mughal architecture and its spread across India. Islamic architecture of the south of India.

Suggested Readings/
References:

1. Fletcher, 1987. Banister. Sir Banister Fletcher's A History of Architecture. London: Butterworths.
2. Kostof. Spiro. 1985. A History of Architecture: Setting and Rituals. New York: Oxford UP.
3. Tadgell, C. A History of Architecture. London: Ellipsis, 2000
4. Tadgell, C. A History of Architecture in India. London: Phaidon Press Limited, 1994
5. Ferguson J., Burgess, J., & Spiers, R. P. History of Indian and Eastern Architecture. New Delhi: Munshiram Manoharlal, 1972
6. Ching, Francis D.K. Mark Jarzombek and Vikramaditya Prakash. 2007. A Global History of Architecture. Hoboken, NJ: J. Wiley & Sons.
7. Ward, John B. 1979. History of World Architecture. London: Faber. Print
8. Norberg-Schulz, Christian and Pier Luigi Nervi. 1971. History of World Architecture. New York: Abrams.
9. Bagenal, Philip. 1980 The Illustrated Atlas of the World's Great Buildings: A History of World Architecture. S.I. : Leisure.
10. Fazio, Michael W., Marian Moffett, Lawrence Wodehouse, and Marian Moffett. 2008. A World History of Architecture Boston: McGraw-Hill.
11. Graber, O.1980. "Kubbat al-Sakhra". In Bosworth, C.E.; van Donzel,, al. The Encyclopedia of Islam, Volume 2, Part -1 (new ed.). Leiden: E.J.Brill.
12. Hillenbrand, Robert 1994. Islamic Architecture: Form, Function, and Meaning. New-York: Columbia University Press.
13. Moffett, Marian; Fazio, Michael W.; Wodehouse, Lawrence 2003. A World History of Architecture (illustrated ed.). London: Laurence King Publishing.
14. Braun, Hugh, An Introduction to English Mediaeval Architecture, London: Faber and Faber. 1951

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR483
Course Title:	Building Construction & Technology - IV
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- Illustrate planning, designing and construction of vertical circulation systems, toilets and kitchen areas based on application of their basic principles.
- Explain and develop components and construction of roofs and roofing system.
- Design components and details of Stairs, Toilets and Kitchens.

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Vertical Transportation systems – <ul style="list-style-type: none"> • Types of stairs, ramps, lifts and escalators; associated requirements and functional aspects. • Design and construction details of staircase in RCC, Steel, wood, etc • Understanding of Installation, working and mechanisms of escalators, travellers, auto-walks, etc • Basic Codes and Standards of practice 	28 hours
Unit-II	Roof and Roofing systems – <ul style="list-style-type: none"> • Classification of roof and roofing systems • Waterproofing and rain water gutter details • Conceptual, construction and functional aspects with different materials. 	16 hours
Unit-III	Toilet and Kitchen – <ul style="list-style-type: none"> • Design and detailing of toilet, bath, utility and kitchen. 	16 hours



- Introduction to associated components, materials, construction processes and techniques.

Suggested Readings/
References:

1. Barry, R. Construction of Buildings Vol - 3: Single Storey Frames, Shells and Lightweight Coverings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
2. Barry, R.. Construction of Buildings Vol - 2: Windows, Doors, Fibers, Stairs Finishes. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
3. Losantos, Agata. Stair Design. Newyork: DAAB Publication, 2006
4. McKay J. K.. Building Construction Vol - 2: Metric. Delhi: Pearson Education Asia Pte. Ltd., 2014
5. McKay, J. K.. Building Construction Vol - 3: Metric. Delhi: Pearson Education Pte. Ltd., 2013
6. McKay, J. K.. Building Construction Vol - 4: Metric. Delhi: Pearson Education Pte. Ltd., 2013
7. Mckay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
8. McLeod, Virginia. Detail In Contemporary Timber Architecture. UK: Laurence King Publishing, 2010
9. Punaima, B. C.. Comprehensive Design of Steel Structures. New Delhi: Laxmi Publications Pvt. Ltd., 2012
10. Punmia, B. C.. Building Construction. New Delhi: Laxmi Publications Pvt. Ltd., 2008
11. Rangawala, S. C.. Building Construction. Anand: Charotar Publishing House, 2014
12. Schillaci, Fabio. Construction and Design Manual Architectural Renderings. Germany: Dom Publishers, 2010
13. Shah, M. G.; Padki, S. Y. ; Kale, C. M.. Building Construction Vol - 4: Metric. New Delhi: Tata McGraw Hill Education Ltd., 2015
14. Watson, Donald. Time saver Standards for Building Materials and Systems: Design Criteria and Selection Data. New Delhi: Tata McGraw Hill Education Private Limited, 2009
15. Watts, Andrew. Modern construction handbook. New York: Springer, 2013
16. .Construction And Design Manual Mobile Architecture. Germany: Dom Publishers, 2012

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR484
Course Title:	Building Information Modeling
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Demonstrate the multi-disciplinary coordination (Architecture, MEP, Structure, Landscape, etc.)
- Apply the skills to improve presentation of drawings
- Create the design in a BIM software and generate working drawings

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Overview of BIM Technology <ul style="list-style-type: none"> • What is BIM? • Introduction: History: BIM vs. Geometric Modeling Elements of BIM 	6 hours

Unit-II	Application of BIM Software	6 hours
	<ul style="list-style-type: none"> • Management of building information models • BIM in construction management • BIM in facility operation <ul style="list-style-type: none"> • BIM in green building 	
Unit-III	Basic modelling	13 hours
	<ul style="list-style-type: none"> • Introduction to Building Information- Modelling –BIM and Revit- User interface – Levels- Grids & Columns – Walls – Doors – Windows – Floors – Stairs – Ceilings – Roofs – Sections – Elevations 	
Unit-IV	Extended modelling and outputs	10 hours
	Curtain walling - 3d views - Rendered outputs - Schedules - Families (basic content creation)- Details & Callouts - Linked files - Layouts & Plotting	
Unit-V	Conceptual modelling Collaboration & Analysis	10 hours
	Organic conceptual modelling - Linking to other modelling software - Collaboration - BIM Analysis	

- Suggested Readings/ References:
1. Garber, Richard. (2014). BIM Design: Realising the Creative Potential of Building Information Modelling. Wiley. 1 edition.
 2. Kensek, Karen M. Noble, Douglas E. (2014). Building Information Modeling: BIM in Current and Future Practice. Wiley..
 3. Eastman, Chuck. Teicholz, Paul. Sacks, Rafael. Liston, Kathleen (2011) BIM Handbook : A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers and Contractors. John Wiley & Sons.
 4. Briscoe, Danelle. (2015) Beyond BIM : Architecture Information Modeling. London Routledge Taylor and Francis Group.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR485
Course Title:	Structure IV
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Develop to gain understanding by using the abstract method of analysis of structures
- Evaluate and develop understanding of basic requirement of stability and strength of materials.
- Evaluate and infer structural elements and their significance in Structural System.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Analysis of indeterminate structures. – <ul style="list-style-type: none"> • Introduction to stiffness and distribution factors • Introduction to moment distribution factors • Introduction to moment distribution method. 	14 hours
Unit-II	Analysis of indeterminate structures – <ul style="list-style-type: none"> • Importance of portal frames in resisting horizontal forces. 	14 hours
Unit-III	Arch as a curved element – <ul style="list-style-type: none"> • Arch in history, efficiency of an arch. <p style="margin-left: 40px;">Three hinged arch. Simple problems to illustrate the importance of the shape of an arch, rise end conditions and loading.</p>	8 hours
Unit-IV	Steel as a structural material –	9 hours



- Structural systems in steel with case studies.

Suggested
Readings/
References:

1. Punmia, B. C., Comprehensive Design of Steel Structures, New Delhi, Laxmi Publications Pvt. Ltd., 2012
2. Subramanian, N., Design of Steel Structures, New Delhi, Oxford University Press, 2012
3. Junnarkar, S. B., Mechanics of Structures Vol – 1, Anand, Charotar Publishing House, 2012
4. Pandya, N. C., Steam Tables: Entirely in SI Units including Mollier Chart, Anand, Charotar Publishing House, 2013
5. Steel Design, Newyork, DAAB Publication, 2007
6. Watson, Donald, Time saver Standards for Building Materials and Systems: Design Criteria and Selection Data, New Delhi, Tata McGraw Hill Education Private Limited, 2009
7. IS 456:2000, Indian Standard, Plain and Reinforced Concrete – Code of Practice, Bureau of Indian Standards.
8. SP – 16, Design Aids for Reinforced Concrete to IS 456
9. National Building Code of India, 1983
10. IS 1905, Code of Practice for Structural Safety of Buildings.
11. Corkill, P. A., H. L. Puderbaugh, and H. K. Sawyers. Structure and Architectural Design. Iowa City: Sernoll, 1974. Print.
12. Sandaker, Bjørn Normann, and Arne Petter. Eggen. The Structural Basis of Architecture. New York: Whitney Library of Design, 1992. Print.
13. Sarkisian, Mark P. Designing Tall Buildings: Structure as Architecture. New York: Routledge, 2012. Print.
14. Seward, Derek. Understanding Structures: Analysis, Materials, Design. Basingstoke: Palgrave Macmillan, 2003. Print.
15. Cowan, Henry J. Architectural Structures: An Introduction to Structural Mechanics. New York: Elsevier, 1976. Print.
16. Miret, Eduardo Torroja, J. J. Polivka, and Milos Polivka. Philosophy of Structures: English Version by J.J. Polivka and Milos Polivka. Berkeley, CA: U of California, 1962. Print.
17. Salvadori, Mario, and Robert A. Heller. Structure in Architecture: The Building of Buildings. Englewood Cliffs, NJ: Prentice-Hall, 1975. Print.
18. Morgan, William, Daniel Williams, and Frank Durka. Structural Mechanics: A Revision of Structural Mechanics. Harlow: Longman, 1996. Print.
19. Rosenthal, Hans Werner., and Hans Werner. Rosenthal. Structural Decisions: The Basic Principles of Structural Theory, Their Application to the Design of Buildings and Their Influence on Structural Form. London: Chapman & Hall, 1962. Print.

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR486
Course Title:	Environmental Science & Services – II
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	1	-	2

Course Learning Outcomes (CLO):

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

- Explain and relate the role and importance of climate as one of the major determinants of built form.
- Identify and interpret the implication of climate as modifying factor of built environment.
- Comprehend various climate-controlling devices.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Water supply, Plumbing & Drainage – <ul style="list-style-type: none"> • Water supply, Plumbing Water related supply systems Potable & Usable water’s supply-storage and sewage, Rainwater’s harvesting & Clearance system. Water consumption for various activities & designing the plumbing system. • Drainage General principles of drainage, manholes, grease chambers Principles of design of drainage lines, drainage layouts Refuse, different forms of refuse garbage, sullage, toilet waste and storm water collection and disposal systems. Drainage in non-municipal areas – soak wells, septic tanks. 	10 hours
Unit-II	Lighting aspects of a building – <ul style="list-style-type: none"> • Sunlight, its principles, radiation Spectrum • Vision, Colors and Visual Comfort • Day-Lighting in buildings, its sources, lighting criteria, the visual field, it’s Behavior-transmission, reflection 	14 hours

	<ul style="list-style-type: none"> • Day lighting factor, prediction methods • Physics of light, Photometry • Artificial lighting, lighting levels for various activities 	
Unit-III	Sound & Acoustics –	6 hours
	<ul style="list-style-type: none"> • Sunlight, its principles, radiation Spectrum • Vision, Colors and Visual Comfort • Day-Lighting in buildings, its sources, lighting criteria, the visual field, it's Behavior-transmission, reflection • Day lighting factor, prediction methods • Physics of light, Photometry • Artificial lighting, lighting levels for various activities 	

Suggested Readings/
References:

1. Jaramillo, Ana. M. Steel, Chris. Architectural Acoustics. New york: Routledge, 2015
2. Ermann, Michael. Architectural Acoustics Illustrated. USA: John and Wiley Sons, Inc, 2015
3. Egan, M Paul. Architectural Acoustics : J. Ross Publishing Classics, Jan 2007
4. Dekay, Mark, Sun, Wind, And Light: Architectural Design Strategies. USA: John and Wiley Sons, Inc., 2014
5. Olgyay, Victor. Design With Climate – Bio-Climatic Approach to Architectural Regionalism. New Jersey: Princeton University Press, 1963
6. Laureano .Water conservation techniques in traditional human settlements .Ghaziabad:Copal,2013
7. .Water .London:Dorling Kindersley,2006
8. Livingston, Jason.Designing with light : the art, science, and practice of architectural lighting design.Canada:John and Wiley Sons, Inc.,2014
9. .Noise mapping in the EU: models and procedures.New York:CRC Press Taylor & Francis Group,2013
10. Muneer, T. & others.Windows in buildings : thermal, acoustic, visual and solar performance. Oxford,Amsterdam,New York :Architectural Press 2000
11. Moore, Fuller. Concepts and practice of architectural daylighting. New Delhi,New York: Van Nostrand Reinhold 1991
12. Steane, Mary Ann. . Architecture of light : recent approaches to designing with natural light Book.London :Routledge, 2011
13. Zaretsky, Michael. Precedents in zero-energy design: architecture and passive design in the 2007 solar decathlon. London & New York :Routledge ,2010
14. Goswami, D. Yogi, Principles of solar engineering. New York Taylor and Francis group 2000
15. Tregenza, Peter; Loe, David. Design of lighting Book. Oxon:Taylor & Francis ,2009 Edwards, Brain Ed. Green buildings pay Book.London: Spon Press, 2003
16. Construction Technology Volume -1 & 2 - BY R. Chudly

17. Construction Technology Volume -1 & 2 BY R. Barry
18. Construction Technology - BY B.C. Punamiya
19. Building Construction Illustrated - Franis D.K. Ching

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NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR487
Course Title:	Introduction to Housing
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	1	-	2

Course Learning Outcomes (CLO):

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

- Infer the importance of the “house and housing” as a basic need of the people.
- Discover the evolution of various housing typology at its merits and demerits
- Create different design alternatives, appropriate material construction technology, appropriate to the context and socio cultural attribution of the people

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Various typology of house and housing – <ul style="list-style-type: none"> • What is Housing? • Concept of Mass Housing • Housing Design Understanding Through A Case Study (Analysis Based) 	10 Hours

Unit-II Housing material, construction, techniques and quality monitoring – 10 Hours

- Different type of concepts on housing
- Utopia to Heterotopia
- Accessible Housing

Unit-III Place, environmental, social, economical and cultural dimensions for housing – 10 Hours

- Site Analysis and Scale of housing
- Context | Concept
- Need for Supporting Facilities

Suggested Readings/ References:

1. Leupen, Bernard, and Harald Mooij. Housing Design: a Manual. NAI Uitgevers, 2018.
2. Habraken, N. J., and Jonathan Teicher. Supports: an Alternative to Mass Housing. Urban International Press, 2011.
3. Bosma, Koos, et al. Housing for the Millions: John Habraken and the SAR (1960-2000). NAI Publishers, 2000.
4. White, Edward T. Site Analysis: Diagramming Information for Architectural Design. ArchiBasX Press, 2013.
5. Correa, Charles. Charles Correa Housing and Urbanisation. Thames & Hudson, 2000.
6. Rybczynski, Witold. How the Other Half Builds. Vol. 1: Space, Centre for Minimum Cost Housing, 1984.
7. Barquin, Carlos. How the Other Half Builds. Vol. 2: Plots, Centre for Minimum Cost Housing, McGill University, 1986.
8. Bhatt, Vikram. How the Other Half Builds. Vol. 3: Self-Selection Process, Centre for Minimum Cost Housing, McGill University, 1990.
9. Wates, Nick, and Jeremy Brook. The Community Planning Handbook: How People Can Shape Their Cities, Towns, and Villages in Any Part of the World. Earthscan from Routledge, 2017.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR488
Course Title:	Related Study Programme (RSP)-III
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	3

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 weeks (30 hours / week)

Total Teaching hours: 90 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals – <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	Compilation and documentation –	30 hours

- Students came back at institute and make the final Documentation report within remaining days.

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NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARS401
Course Title:	Social Work
Course Type:	Value Added Course
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

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

Understand social work role and develop the knowledge and theory associated with social work practice • Work with NGO's & participate in social welfare work towards society development.

Become aware of the role and need of social work in the society

1. Appraise the methods and techniques of social work and its practice
2. Develop awareness and participate in social welfare work towards society development

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Understanding social in social work – <ul style="list-style-type: none"> • Sensitive to the needs of different people within the society and to social problems in changing social, cultural and techno-economic context; 	10 Hours
Unit-II	Social work as a practice – <ul style="list-style-type: none"> • To inculcate in the need for inquiring and research to understand the social issues/ problems within a context • Develop problem solving and decision making abilities for relevant concerns through the medium of social work as a 	20 Hours

Suggested Readings/ References:

1. Banks, S. (1995). Ethics and Values in Social Work: Practical Social Work Series, London: Macmillan Press Ltd.
2. Friedlander, Walter A. (1977) Concepts and Methods of Social Work, New Delhi: Prentice Hall of India Pvt. Ltd
3. Heun, Linda R., Heun, Richard E. (2001) Developing Skills for Human Interaction, London: Charles E. Merrill Co.
4. Skidmore, Rex A.(1982), Introduction to Social Work, New Jersey, Thackeray, Milton G. Prentice-Hall, Englewood Cliffs.
5. Surendra Singh (Chief Editor). (2012): Encyclopedia of Social Work in India. Lucknow: New Royal Book Company.



NIRMA UNIVERSITY
INSTITUTE OF ARCHITECTURE and PLANNING

TEACHING AND EXAMINATION SCHEME FOR SEMESTER V - B.ARCH.

Name of the Programme: Bachelor of Architecture

SEMESTER VI

Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination		
		Hours/ Week			Credit		Component Weightage	SEE	CE
		L	W	S	C	SEE			
CORE COURSES									
2AR661	Architectural Design Studio - VI	-	-	12	12	-	-	0.5	0.5
2AR662	History & Theory - VI	2	-	-	2	3	0.3	0.5	0.2
2AR663	Building Construction & Services	2	2	-	4	3	0.3	0.5	0.2
2AR664	Environmental Design and GIS Application	-	2	-	2	-	-	0.5	0.5
2AR665	Development Control Regulation	1	2	-	3	3	0.3	0.5	0.2
2AR666#	Related Study Programme – V #	-	-	-	4#	-	-	-	1
2AR667#	Field Studio#	-	-	-	5#	-	-	-	1
Institute Elective courses as per Annexure-1									
Yet to be decided	Elective	1	1	-	2	-	-	0.5	0.5
Yet to be decided	Elective	1	1	-	2	-	-	0.5	0.5
SUPPLEMENTARY COURSES/ VALUE ADDED COURSES									
Yet to be decided	Value Added Courses*	-	2	-	-	-	-	-	1
Total		7	10	12	27/ 31\$/ 33\$				
<p># Students can register either for 2AR667 (Related Study Programme – IV) or 2AR668 (Field Studio) in this semester, as per the following condition –</p> <ul style="list-style-type: none"> • 3 RSP and 1 Field Studio is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed upto Semester VII and remaining 1 RSP up to Semester X. And 1 Field Studio needs to be completed between Semester-V to X <p>\$ Credit of RSP or Field Studio will be given to students based on their registration in the respective semester</p> <p>* Value Added courses offered in respective semester as offered by the Dean, FoAP,IAP,NU (As per attached Annexure-C)</p> <p>Institute Elective courses as per Annexure-A</p>									
<p>L: Lecture, W: Workshop, S: Studio, C: Credit CE: Continuous Evaluation, LPW: Lab/Project/Studio Work, SEE: Semester End Examination</p>									

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR661
Course Title:	Architectural Design Studio - VI
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	12	12

Course Learning Outcomes (CLO):

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

- Develop the design proposal, which reaches to execution stage.
- Organize production of detail drawings necessary for execution.
- Appraise the importance of detail, integration of Building systems, clarity and effective communication of production drawings

Syllabus: 15 weeks (12 hours/week)

Total Teaching hours: 180 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Design Resolution from presentation to execution – <ul style="list-style-type: none"> • Part – Whole relationship – Back and forth design processes • Exposure to materials, products, assembly constructional principles. 	24 hours
Unit-II	Preliminary design to Design development – <ul style="list-style-type: none"> • Analysis of various buildings elements-foundation-wall-floor-roof etc. • Resolution of appropriate systems • Explanation of structure system • Centre line drawing set (plans/ elevations and sections) 	72 hours
Unit-III	Detail development of various spaces / building elements - <ul style="list-style-type: none"> • Stair/Ramp/Elevator, etc. 	48 hours



- Kitchen/Pantry/Utility, etc.
- Toilet/WC/Bath/Chokdi, etc.
- Spot detail of various joineries/ connections/ finishes etc.
- Site development and incorporation of services (water supply, Drainages, electricity, telephone, gas pipeline, etc.)

Unit-IV Design Resolution with Synthesis of design parameters - 36 hours

- Methods of specification writing information systems used in working drawings.
- Complete set of Drawing with portfolio
- Structural and Services Resolution of Part (Short Project) including calculations and specifications/ approximate costing

Suggested Readings/ References:

Cooper, J., & Beck, H. (2003). Glenn Murcutt: A singular architectural practice. Mulgrave Vic.: Images Publ. Group.

Hedges, Keith E. Architectural Graphic Standards. John Wiley & Sons Inc., 2017.

Details in Architecture: Creative Detailing by Some of the World's Leading Architects ; Volume One to Five. Images Pub. Group, 2002.

Ford, Edward R. The Details of Modern Architecture ; Volume One and Two. MIT Press, 1997.

Buchanan, Peter. Renzo Piano Building Workshop: Complete Work ; Volume One to Five. Phaidon, 2008.

Samuel, Flora. Le Corbusier in Detail. Routledge, 2016.

Brawne, Michael, and Louis I. Kahn. Louis I. Kahn Architecture in Detail. Phaidon Pr, 1992.

Killory, Christine, and Rene Davids. Detail in Process. Princeton Architectural Press, 2008.

McLeod, Virginia. Detail in Contemporary Glass Architecture. Laurence King Publishing, 2011.

Phillips, David, and Megumi Yamashita. Detail in Contemporary Concrete Architecture. Laurence King Pub., 2012.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR662
Course Title:	History and Theory-VI
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	-	-	2

Course Learning Outcomes (CLO):

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

- Synthesize the beginning and the causes of the post-modern and subsequent movements
- Assess the context through which ideas developed as a linear consequence of events
- Review and investigate the theories developed in the later part of 20th and early 21st Century

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Post-modern architecture – <ul style="list-style-type: none"> • Post modern as a response to modern architecture. • Philosophical arguments with the post-modern theory • Major post-modernists and projects 	6 hours
Unit-II	Critical regionalism – <ul style="list-style-type: none"> • Kenneth Frampton’s theory of critical regionalism • Architects and projects related to the movement 	6 hours
Unit-III	Deconstructivism - <ul style="list-style-type: none"> • Theory of deconstructivism as espoused by Jacques Derrida • Application of deconstructivist theories into architecture • Work of such architects like Peter Eisenman, Bernard Tschumi, Zaha Hadid, Daniel Libeskind, Coop Himmelblau (firm), Rem Koolhaas, etc. 	6 hours
Unit-IV	Contemporary architecture – <ul style="list-style-type: none"> • Architecture till the contemporary time • Positions and theories of architecture after 	6 hours



deconstructivism

- Parametric architecture, New Urbanism, Landscape urbanism, Computational Design, etc.
- Return to sustainability and building engineering

Unit-V Contemporary architecture of India –

6 hours

- Architecture of India after the modern movement
- Major Indian figures like B. V. Doshi, Charles Correa, Raj Rewal, Laurie Baker, etc.

Suggested

Readings/

References:

1. Fletcher, 1987. Banister. Sir Banister Fletcher's A History of Architecture. London: Butterworths.
2. Kostof. Spiro. 1985. A History of Architecture: Setting and Rituals. New York: Oxford UP.
3. Tadgell, C. A History of Architecture. London: Ellipsis, 2000
4. Tadgell, C. A History of Architecture in India. London: Phaidon Press Limited, 1994
5. Ching, Francis D.K. Mark Jarzombek and Vikramaditya Prakash. 2007. A Global History of Architecture. Hoboken, NJ: J. Wiley & Sons.
6. Ward, John B. 1979. History of World Architecture. London: Faber. Print
7. Norberg-Schulz, Christian and Pier Luigi Nervi. 1971. History of World Architecture. New York: Abrams.
8. Bagenal, Philip. 1980 The Illustrated Atlas of the World's Great Buildings: A History of World Architecture. S.I. : Leisure.
9. Fazio, Michael W., Marian Moffett, Lawrence Wodehouse, and Marian Moffett. 2008. A World History of Architecture Boston: McGraw-Hill.
10. Moffett, Marian; Fazio, Michael W.; Wodehouse, Lawrence 2003. A World History of Architecture (illustrated ed.). London: Laurence King Publishing.
11. Alici, A. (2010). Contemporary architecture. Milan: Motta Architettura.
12. Jencks, C. (1991). The language of post-modern architecture. London: Academy Editions.
13. Jencks, C. (2002). The new paradigm in architecture: The language of post-modernism. New Haven, CT: Yale University Press.
14. Johnson, P., & Wigley, M. (1988). Deconstructivist architecture: The Museum of Modern Art, New York,. Boston: Little, Brown and Company.
15. Puglisi, L. P. (2008). New directions in contemporary architecture: Evolutions and revolutions in building design since 1988. Chichester, England: Wiley.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR663
Course Title:	Building Construction & Services
Course Type:	Core
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-	2	-	4

Course Learning Outcomes (CLO):

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

- To make students aware of the process of Pre-fabrication in advanced building construction processes
- Understand the management of building services in construction sites
- To relate building services like electrical, mechanical, acoustical and water and sanitation services, as a part of construction process

Syllabus: 15 weeks (4 hours/week)

Total Teaching hours: 60 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Steel Frame & Large Span Structures – <ul style="list-style-type: none"> • Introduction to a wide range of modern building construction systems incorporating the use of metals like steel, aluminum and composite materials. • Construction of steel structures (Factory shed/ large span) • Multi- storied steel frame structures connections and their components • Materials of Suspended Ceilings in Multi storied buildings: Study variety of false ceiling types and materials available in the market • Modern Factory Shed Construction: Study of modern building construction materials. 	10 hours
Unit-II	Building Services – Advanced HVAC Systems in Buildings <ul style="list-style-type: none"> • Principles, laws and terminologies related to HVAC • Advanced HVAC System in Buildings – VRV, VRF, Heat Recovery Systems, etc 	30 hours
Unit-IV	Acoustic Systems– <ul style="list-style-type: none"> • Fundamentals of Acoustics, Noise Isolation & Control • Methods of Sound Insulation - control of mechanical noise and vibrations. • Acoustical design of auditorium and other acoustically sensitive enclosures meant for speech, music, lecture, etc Building Services – Ducts & Vertical Transport systems <ul style="list-style-type: none"> • Electrical & Mechanical services – lift, elevators, conveyors and escalators, etc 	20 hours



- Various types of Ducts, Shafts – Fire, Electrical & Plumbing Shafts in Buildings

Suggested Readings/
References:

- Barry, R. Construction of Buildings Vol - 3: Single Storey Frames, Shells and Lightweight Coverings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
- Barry, R. Construction of Buildings Vol - 4: Multi-Storey Buildings, Foundation and Substructures, Structural Steel Frames, External Walls and Cladding of Framed Buildings. New Delhi: Affiliated East-West Press Pvt. Ltd., 1999
- McKay J. K.. Building Construction Vol - 2: Metric. Delhi: Pearson Education Asia Pte. Ltd., 2014
- McKay, J. K.. Building Construction Vol - 3: Metric. Delhi: Pearson Education Pte. Ltd., 2013
- McKay, J. K.. Building Construction Vol - 4: Metric. Delhi: Pearson Education Pte. Ltd., 2013
- McKay, W. B.. Building Construction Vol - 1: Metric. New Delhi: Pearson Education Asia Pvt. Ltd.; India, 2013
- McLeod, Virginia. Detail In Contemporary Timber Architecture. UK: Laurence King Publishing, 2010
- Millias, Malcolm . Building structures from concept to design . London: Spon Press, 2005
- Muttoni, Aurelio. Art of Structures: Introduction to the Functioning of Structures in Architecture. UK: Taylor & Francis, 2011
- Paulson, Boyd C.. Computer Applications in Construction. New Delhi: McGraw Hill Education India Pvt Ltd, 2014
- Phillips, David. Detail In Contemporary Concrete Architecture. UK: Laurence King Publishing Ltd, 2012
- Punaima, B. C.. Comprehensive Design of Steel Structures. New Delhi: Laxmi Publications Pvt. Ltd., 2012
- Punmia, B. C.. Building Construction. New Delhi: Laxmi Publications Pvt. Ltd., 2008
- Rangawala, S. C.. Building Construction. Anand: Charotar Publishing House, 2014
- Ruske, Wolfgang. Timber Construction for Trade, Industry, Administration: Basics and Projects. Switzerland: Birkhauser- Publisher of Architecture, 2004
- Salvadori, Mario. Why Buildings Stand Up: The Strength of Architecture. New York: W. W. Norton and Co., 1980
- Schodek, Daniel L.. Structures. New Delhi: PHI Learning Private Limited, 2014
- Watson, Donald. Time saver Standards for Building Materials and Systems: Design Criteria and Selection Data. New Delhi: Tata McGraw Hill Education Private Limited, 2009
- Building Construction Dr. B. C. Punmia Laxmi Publications (P) Ltd., New Delhi
- Building Construction P. C. Varghese PHI Learning (P) Ltd., New Delhi
- Building repair and Maintenance Management P. S. Gahlot CBS

Publishers & Distribution(P) Ltd

- A text book on Building Services R. Udaykumar Eswar Press, Chennai
- Building Services S. M. Patil Seema Publication, Mumbai Revised edition
- National Building Code of India - 2005 Bureau of Indian Standards BIS, New Delhi



Name of Programme:	Bachelor of Architecture
Course Code:	2AR664
Course Title:	Environmental Design and GIS Application
Course Type:	Core
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
2	-	-	-		-	2

Course Learning Outcomes (CLO):

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

- Identify the role and importance of climate and culture in built environment.
- Apply climatic, cultural context and sustainability principles in spatial planning and design of public spaces
- Know fundamentals of GIS and work with database on GIS

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Introduction to climate, culture and built environment – <ul style="list-style-type: none"> • Elements of climate, Tropics and its Climatic zones • Different agro-climatic zones in India • Importance of Earth’s orbit, and Sun path in determining the climatic and weather conditions 	4 hours
Unit-II	Sustainability at various scales of urban form <ul style="list-style-type: none"> • Elements and scales of urban form • Issues of sustainability at various scales of urban form • Urban landscape and ecology, biodiversity • Site planning and layout • Emerging climatic challenges 	10 hours

- Urban public spaces - place, people and activities
- Relationship between built and un-built elements to create experiences of the built environment
- Pattern language at various scales

Unit-IV GIS Application for Site Planning

6 hours

- Concept and Definition, Components and Functions of GIS
- ArcMap, Exploring Graphical User Interface (GUI), Identifying the toolbar and its tools
- Understanding Maps and Layers
- Understanding Vector and Raster datasets
- Application in site planning and layout specific to contexts

Suggested Readings/
References:

1. Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Shlomo, A. (1977). *A pattern language: Towns, buildings, construction*.
2. Alexander, C, Neis, Hajo; Anninou, Artemis; King, Ingrid (1985) *New Theory of Urban Design*. Center for Environmental Structure Series.
3. Cullen, Gordon, *The Concise Townscape*, Architectural Press, 1961
4. David J Maguire et al, "*GIS, Spatial Analysis, and Modelling*", ESRI Press
5. Dekay, Mark (2014) "*Sun, Wind and Light: Architectural Design Strategies*" USA: John and Wiley Sons Inc.
6. Gehl, Jan, *Life between Buildings*, Island Press, 1971.
7. Lynch, Kevin and Hack, Gary, *Site Planning*, The MIT Press, 1984
8. Mesfin T Bekalo et al, "*Landuse Change Detection using GIS, Remote Sensing and Spatial Matrices*", Lap Lambert Academic Publications
9. Olgyay, Victor (1963) "*Design With Climate – Bio-Climatic Approach to Architectural Regionalism*" New Jersey: Princeton University Press
10. PA Longley et al, "*Geographic Information Systems and Science*", John Wiley and Sons Ltd.
11. Vastu Shilpa Foundation for Studies and Research in Environmental Design. (1990). *Towards: A Humane Habitat: Directions for a Code of Planning and Design Practices*. Ahmedabad Vastu-Shilpa Foundation.
12. Whyte, William H, *The Social Life of Small Urban Spaces*, Project for Public Spaces, 1980



Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR665
Course Title:	Development Control Regulation
Course Type:	Core
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
1	-	-	-	2	-	3

Course Learning Outcomes (CLO):

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

- Interpret the role and function of various statutory authorities responsible in the development of a city.
- Examine building bye-laws and other regulations related to the buildings.
- Comprehend the role of various statutory authorities responsible in for urban development and standard procedures for building/ scheme plan approval and whetting
- Apply knowledge of building and plan approval processes

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit	Syllabus	Teaching hours
Unit-I	INTRODUCTION TO BUILDING BYE-LAWS	6 hours
	<ul style="list-style-type: none"> • History of building bye-laws, regulations and need for development control guidelines (early post-industrial cities; safety, health and hygiene concerns) • Definitions/ general building requirements & services. • Requirement for parts of the buildings and building services 	

Unit-II	PLANNING NORMS, STANDARDS AND GUIDELINES	9 hours
	<ul style="list-style-type: none"> • Brief introduction to the urban development framework - eg. GTPUDA • Purpose and specifications under Development controls regulations and Zoning guidelines - CGDCR, URDPFI guidelines • General as well as Specific premises - Commercial/ Industrial plots, Transportation (streets, roads, parkings and terminals), Public - Semi Public spaces • Notified Areas, NOCs 	
Unit-III	CODES AND STANDARDS FOR VARIOUS LAYOUTS, TYPOLOGIES AND BUILDING TYPES –	12 hours
	<ul style="list-style-type: none"> • Various provisions and guidelines as per National Building Codes (NBC) • Developing focus on sunlight, ventilation, thermal comfort, drainage, circulation, parking, access of emergency vehicles, universal access, fire safety, disaster resilience and other context specific factors • Site layouts, public infrastructure such as educational institutions and hospitals, parking, streets and roads, common infrastructure, open and recreational spaces • Brief introduction to other regulatory contexts to be considered - RERA, Green building regulations - ECBC, GRIHA rating system, Environmental Clearances (where applicable such as hilly area planning, coastal regulations) 	
Unit-IV	BUILDING PERMISSIONS -	9 hours
	<ul style="list-style-type: none"> • Building permissions and approvals • Signing of Plans, Notice for alterations, Building Permit Fees, Sanctions, Procedures and permissions during Construction works, Connection to the municipal sewer/ water mains, Fire Protection & Fire safety Requirements • Notice for Completion, Completion/ Permission for Occupation, Occupancy/ Part Completion Certificate 	
Unit-V	CASE STUDIES TO DEMONSTRATE APPLICATION	9 hours
	<ul style="list-style-type: none"> • Zoning guidelines for land use distribution • Development controls for site layout • Building codes for typology 	

Suggested
Readings/
References:

1. Althouse AD, Turnquist CH, Bracciano AF, (1968), *Modern refrigeration & Air conditioning Book: theory, practice of refrigeration & air conditioning systems* Bureau of Indian Standards, *National Building Code of India*, 2016
2. Gallion, Arthur and Simon, Eisner, *Urban Pattern: City Planning and Design*, Van Nostrand Reinhold, 1986
3. Government of Gujarat, *Gujarat Town Planning and Urban Development Act (GTPUDA)*, 1976
4. Grondzik, W. T., & Kwok, A. G. (2014). *Mechanical and electrical equipment for buildings*. John Wiley & Sons.
5. Howell, Ronald H. & others., (2009), *Principles of heating ventilating and air conditioning : a textbook with design data based on the 2009 ASHRAE handbook - fundamentals* . Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
6. HW Stanford III, AF Spach , (2019), *Analysis & Design of Heating, Ventilation & Air conditioning systems*.
7. M Karlen, C Spangler, J R Benya , (2017), *Lighting design basics*.
8. H Koster, (2004), *Dynamic day lighting architecture: basics, systems and projects*.
9. Ministry of Housing and Urban Affairs (MoHUA), *Urban and Regional Development and Planning Formulation and Implementation Guidelines (URDPFI)*, 2015 accessed from [http://mohua.gov.in/upload/uploadfiles/files/URDPFI%20Guidelines%20Vol%20I\(2\).pdf](http://mohua.gov.in/upload/uploadfiles/files/URDPFI%20Guidelines%20Vol%20I(2).pdf) visited on 23rd July, 2019
10. Prakash, N. Sessa, *Manual of Fire Safety* .New Delhi: CBS Publishers and Distributors. 2011.
11. Roberts, Victor & Krepchin, Ira Eds. (2005), *Lighting: Technology Atlas*. Colorado: Platts research and consulting.
12. Roman Showranek , *Basics of building services lighting design*.
13. Sugarman, S. C. (2015), *Testing and balancing HVAC air and water systems*. Lulu press, Inc.
14. Tomczyk John , Silberstein Eugene, Whitman Bill, Johnson Bill, (2012), *Refrigeration & Air conditioning technology*.
15. Town & Country Planning Organisation; Ministry of Urban Development, *Model Building Bye Laws 2016*; Govt. Of India 2016
16. Urban Development and Urban Housing Department, *Comprehensive General Development Control Regulations (GDCR)*, 2017 accessed from <https://townplanning.gujarat.gov.in/Documents/Final%20Comprehensive%20General%20Development%20Control%20Regulation-2017%20dt%2012%2010%2017.pdf> visited on visited on 23/07/2019
17. VP Lang, (1961), *Basics of Air conditioning*.

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR666
Course Title:	Related Study Programme (RSP)-V
Course Type:	Core
Year of introduction:	2016-17

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	4

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 weeks (30 hours / week)

Total Teaching hours: 90 Hrs

Unit	Syllabus	Teaching hours
Unit-I	<p>Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals –</p> <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	<p>Compilation and documentation –</p> <ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	30 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2AR667
Course Title:	Field Studio
Course Type:	Core
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	PW	W	S	
-	-	-	-	-	-	5

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.
- Analyze site character and analyze site
- Design appropriate and innovative Architectural Solution for environmental, technological, social, economic and cultural context engrained within the site context

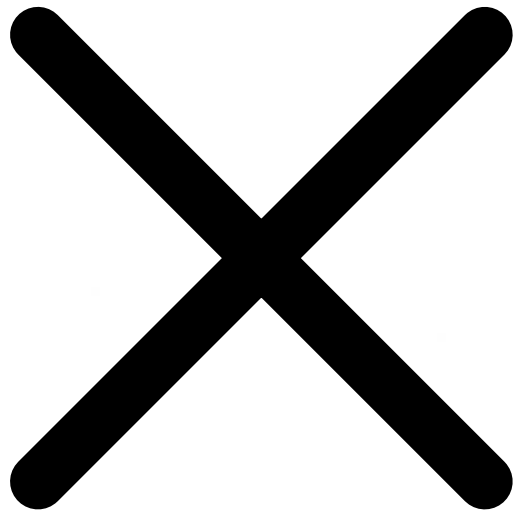
Syllabus: 4 weeks (30 hours / week)

Total Teaching hours: 120 Hrs

Unit	Syllabus	Teaching hours
Unit-I	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals – <ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	60 hours
Unit-II	Compilation and documentation – <ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	20 hours

Unit-III Identify and formulate design project based on concerns and issues – 40 hours
Students define design intervention of varied nature like commercial, institutional, mass housing, recreational, transportation, entertainment, etc.
Students realise their own design capacity, capability and inclination and choose/select their design project based on that.
Site selection/identification based on typical characteristics of the site or location in the region, city, etc.

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Value added courses to be offered in Semester-IV and Semester-VI:

Value Added Courses (Semester-IV and Semester-VI)*	
2ARV01	Installation Design and Execution
2ARV02	Appropriate & emerging material & technology in construction
2ARV03	Portfolio Making
2ARV04	Performing Arts (Dance, Drama, Music)
2ARV05	Representation Skill development
2ARV06	Visualization Skills
2ARV07	Movie Making
2ARV08	Soft Skills for Professionals
2ARV09	Art in Architecture
2ARV10	Graphic and Product Design



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV01
Course Title:	Installation Design and Execution
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Apply knowledge of Design and Construction for preparing Site-specific Installations from materials such as Metal, Bamboo, Wood, etc.
- Do market survey of materials, estimation and costing of installations.
- Work as a team and mobilise man-power for doing site specific works.
- Undertake entire process of Installation Design from idea generation to execution.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Basics of Installation Design – <ul style="list-style-type: none"> • Study of space, site, location, situation, immersive experience, viewer relations, and exhibition design. • Exploration of relationship between the work of art and the environment in which it is installed. • Researching new processes and methods of making and construction. 	6 hours
Unit – II	Sculptural and structural installations –	10 hours

- Understanding of metals and techniques to work with metals like welding, bending, drilling, clamping, etc
- Understanding of Bamboo, Wood, Cane and techniques of working like sawing, planing, polishing, jointing, etc
- Working with materials like Plastics, Paper, Rope, Fabric, etc
- Understanding and managing installation processes, priorities and schedules of workspace.
- Market survey of materials, estimation and costing of installations.
- Hands-on working with materials and knowledge of working with tools.
- Implement knowledge of building construction and technology for installation process, durability and stability of Installations.

Unit – III **Graphic Design and Art Installations –**

14 hours

- Different types of collages and montages
- Collages and Montages as tool to represent ideas
- Effect of colour and graphic on space and people
- Colour Theory and meaningful use of colour
- Knowledge of Surface finishes - paint, coating, patina, polish, etc

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV02
Course Title:	Appropriate & emerging material & technology in construction
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Various emerging construction technology and their application in building'
- Appropriate materials and technology in various context (Climate, geography, location etc.)
- Design and Practical work - Hands on construction of building elements using appropriate materials and various construction methods

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Emerging and appropriate Material – <ul style="list-style-type: none"> • Explore various building materials appropriate for the context and method of building • Explore various vernacular techniques of building and establish the relation to current times 	5 hours
Unit – II	Design – <ul style="list-style-type: none"> • Design an element using various materials and construction methods 	5 hours

- Work out the joinery and details, prepare models

Unit – III Hand on work –

20 hours

- Build the element designed
- Learn the technique of building various components of a building



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV03
Course Title:	Portfolio making
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Explore different softwares required to clean, organise and compile architectural academic work
- Compile architectural academic work in a form of Architectural Portfolio
- Understand different digital printing methods required to make hardcopy of Architectural Portfolio.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Organising and Cleaning Data – <ul style="list-style-type: none"> • Explore various methods of organising and cleaning diferent architectural works i.e drawing, sketches, model etc • Photoshop (or equivalent) tools and tutorials 	5 hours
Unit – II	Layout and Formating – <ul style="list-style-type: none"> • Various layouts for architectural portfolio and their 	15 hours

significance

- Illustrator (or equivalent) tools and tutorial
- Indesign (or equivalent) tools and tutorial

Unit – III Printing –

10 hours

- CMYK and RGB color profile
- Control over file size
- Digital printing methods and paper qualities
- Various binding methods



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV04
Course Title:	Performing Arts (Dance, Drama, Music)
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Explore and appreciate various fields of performing arts
- Understand the basic elements of dance, drama and music
- Practically work on dance/music/drama performance

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Dance – <ul style="list-style-type: none"> • Explore and communicate ideas, feelings and thoughts • The basic elements of dance: actions, dynamics, space, relationships, choreographic devices, introduction to contact, performance skills, choreographic skills and appreciation skills 	10 hours
Unit – II	Drama – <ul style="list-style-type: none"> • Explore a theme/topic/issue 	10 hours

- Basic elements of drama and its vocabulary
- Write reviews and develop an interesting script

Unit – III Music & Poetry –

10 hours

- Basic elements of music
- Use different forms of music
- Practical skills - new computer technology and keyboards, and will be encouraged to take part in group performances, both vocal and instrumental
- Poetry writing and narration



Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV05
Course Title:	Representation Skill development
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Develop better rendering skills, make technically correct and presentable rendered drawings that help in communicating their ideas or drawings better
- Develop better model-making skills, make precise, well-finished models using appropriate materials.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Rendering – <ul style="list-style-type: none"> • Techniques of rendering with different mediums - demonstration and hands on • Final rendering complete sheet set using suitable rendering technique 	15 hours
Unit – II	Model-making – <ul style="list-style-type: none"> • Basic techniques of model making with different materials - demonstration and hands on simple solids • Cutting, folding, handling materials, neatness and 	15 hours

finishing of models

- Preparing models of the studied structure



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV06
Course Title:	Visualization skills
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Develop better sketching skills, make realistic live proportionate sketches with correct perspective views and will also be able to express and communicate through the medium of sketches
- Develop better rendering skills, make technically correct and presentable rendered drawings that help in communicating their ideas or drawings better
- Develop better model-making skills, make precise, well-finished models using appropriate materials.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Sketching – <ul style="list-style-type: none"> • Techniques of sketching - demonstration and hands on, Selection of appropriate viewpoints for sketching of perspective views, overall view, detail elements, interior and exterior view, etc. • Live sketching on field and application of all the learnings 	10 hours

Unit – II Collages –

10 hours

- Manual & digital ways, modern approaches etc
- 2D Collages
- 3D Collages

Unit – III Model-making –

10 hours

- Model making with different materials - demonstration and hands on simple solids
- Model-making is a medium to conceptualize ideas



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV07
Course Title:	Movie Making
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Learn basic of movie making process
- Develop understanding of pre and post production processes

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Movie-making – <ul style="list-style-type: none"> • Development – concept, script-writing • Pre-production – storyboarding, role defining, location scouting, scheduling contents • Production – camera, scene composition • Post-production – editing, video & audio 	30 hours

NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV08
Course Title:	Soft Skills for Professionals
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

This Course will help students to prepare themselves for the professional career. It will help them to overcome fear of facing personal interviews and group discussion. They will learn to communicate and present themselves with professional competency. They will also develop an understanding of their role within the professional organization over and above the importance of team dynamics at a workplace.

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

1. Prepare their Resume/CV
2. Develop skills required for Personal Interviews.
3. Perform and Communicate as a Professional.
4. Become aware of their role as an Employee and a Team Player.

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	<u>Resume Building</u> 4 hrs. <ul style="list-style-type: none"> • Understanding CV format • Significance of facts – Organizational skills for CVs 	4 hours



	<ul style="list-style-type: none"> • Discussion on various CVs related to different industries • A small CV making Exercise – CV writing skills • Discussion on portfolios • Assignment – build your CV 	
Unit – II	<u>Discussing individual CVs</u> <ul style="list-style-type: none"> • Corrections in CVs • Finalizing CVs • Adding portfolios where needed. 	4 hours
Unit – III	<u>Group Discussions</u> 8 hrs. <ul style="list-style-type: none"> • Discussion on various topics of GD • Content of GDs • Performance based Analysis– what to expect • Strategic thinking and communication skills • Understanding non-verbal communication • Videos on group discussion 	6 hours
Unit-IV	<u>Mock Groups Discussions</u> 2hrs. <ul style="list-style-type: none"> • Group discussion exercises – • Group discussion team competitions – video recording for assessment • Analyzing and discussing performances and contents • Presentation skills 	2 hours
Unit-V	<u>Mock interviews</u> 3 hrs <ul style="list-style-type: none"> • One-on one interviews • Video shooting to be analyzed • Analysis and amendments • Assertiveness Vs. being positive 	3 hours
Unit-VI	<u>Team Vs. individual</u> 2 hrs	3 hours

	<ul style="list-style-type: none"> • Understanding Team dynamics • Being a team player – team goals and Individual goals • Team building exercises • Networking – social and professional 	
Unit-VII	<p>Practicing Group Discussions</p> <ul style="list-style-type: none"> • CV corrections – as per the job descriptions of the invited firms 	2 hours
Unit-VIII	<p>Practicing Group Discussions</p> <ul style="list-style-type: none"> • CV corrections – as per the job descriptions of the invited firms 	3 hours
Unit-IX	Mock interviews - with a panel of in-house faculties (if it's feasible)	3 hours



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV09
Course Title:	Art in Architecture
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Appreciate the role of art in the built-environment
- Understand the significance of graphic in visual communication and architecture

Role of art in history of world architecture; Symbiotic relationship of folk art and architecture; application of different art forms in architecture; Visual communication in architecture and way finding; Works of different artists and architects that reflect the inter relationship

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Role of art – <ul style="list-style-type: none"> • Role of art in history of world architecture • Symbiotic relationship of folk art and architecture • Application of different art forms in architecture 	15 hours
Unit – II	Visual communication and Art –	15 hours

- Visual communication in architecture and way finding
- Works of different artists and architects that reflect the inter relationship



NIRMA UNIVERSITY

Institute:	Institute of Architecture and Planning
Name of Programme:	Bachelor of Architecture
Course Code:	2ARV10
Course Title:	Graphic and Product Design
Course Type:	Value Added Course
Year of introduction:	2021-22

Credit Scheme

L	T	Practical component				C
		LPW	P	W	S	
-	-	-	-	2	-	-

Course Learning Outcomes (CLO):

During the course, students will be able to -

- Interpret the importance and relevance of Graphic design
- Develop the knowledge of various compositions based on the typology.
- Understand product design and manufacturing process

Syllabus: 15 weeks (2 hours/week)

Total Teaching hours: 30 Hrs.

Unit	Syllabus	Teaching hours
Unit – I	Principles in graphic design – <ul style="list-style-type: none"> • Principles of Compositions in graphic design and Detail • Importance of Visual Balance & colors in signage 	10 hours
Unit – II	Introduction Of graphic Software <ul style="list-style-type: none"> • I.E. Coral Draw, Adobe Photoshop, Adobe Illustrators, Lightroom (Over View And Biggner Level Exploration) Execution of Graphics <ul style="list-style-type: none"> • Introduction Of Printing or/and physically various 	8 hours

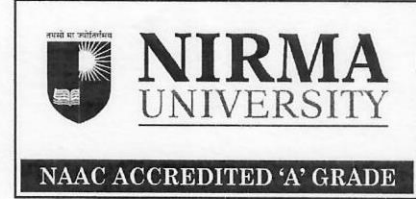
Unit – III Product Design –

12 hours

- Concept of form and space in product design; Relating Form to Materials and Processes of Manufacture
- Use of Computers for Form generation
- Creativity techniques; product detailing and manufacture
- Exploratory mockup models for concept development, refinement and detailing
- Product design prototyping and advanced manufacturing processes
- Preparing models of the studied structure

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NU/AC/AC-300621/8(C)/21-82
Date: 24.09.2021



NOTIFICATION

- Read: 1. R-44 – Empowering the Academic Council to approve Teaching & Examination Scheme, Syllabi, etc published vide notification No. NU-442 dated 27.01.2004
2. Notification No. NU-23 dated 24.07.2020 – Swapping of all courses of Sem.-VII to Sem.-VIII for AY 2020-21 only due to COVID-19
3. Resolution No. 3(C) – Faculty of Architecture & Planning meeting – 09.04.2021
4. Resolution No. 8(C) – Academic Council meeting – 30.06.2021

Sub: Reshuffling of the course– ‘Professional Training’ from Semester-VIII to Semester-VII of B.Arch. programme

It is hereby notified for information of all concerned that the Academic Council in its meeting held on 30.06.2021 under resolution No. 8(C) in exercise of powers conferred upon it by the Board of Governors under regulation mentioned at serial 1 above and taking into consideration the recommendations of the Faculty of Architecture & Planning, has resolved to approve the reshuffling of the course– **Professional Training** from Semester-*VIII* to Semester-**VII** of **B.Arch.** programme for students to be registered in the respective semester in academic year 2021-22 onwards as per **Appendix-A** attached herewith.

Executive Registrar

Encl.: Appendix-A [Pages 1 and 2]

To,

1. Dean, Faculty of Architecture & Planning
2. Academic Coordinator
3. Dy. Registrar: Exam; IAP

Copy to,

1. Exam Sec.
2. OS
3. Library
4. P.A. to ER

c.f.w.cs to: Director General

**NIRMA UNIVERSITY
INSTITUTE OF ARCHITECTURE & PLANNING
TEACHING AND EXAMINATION SCHEME**

**Bachelor of Architecture
SEMESTER VII**

Course Code	Name of the Course	Teaching Scheme				Scheme of Examination					
						Duration		Component Weightage			
		L	T	P	C	SEE	LPW/PW	CE	LPW/PW	SEE	
Core course											
2AR750	Professional Training	(Min 18 week of office training outside institute)				24	-	-	-	1	-
2ARS07	Related Study Programme #	(2/3 Weeks, Block course) (Minimum 21 days X 8 Hrs. = 168 Hrs.)				3#	-	-	-	1#	-
Total		-	-	-	24/27\$	-	-	-	1	-	
Elective											
No elective											
TOTAL					24/27\$	-		-	-	-	

L: Lecture,
C: Credit

T: Tutorial,

P: Practical,

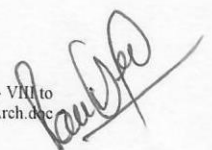
CE: Continuous Evaluation,

LPW: Lab/Project/Studio Work,

SEE: Semester End Examination

#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester V and remaining 2 RSP before registration in Semester X.

\$ Credit of RSP will be given to those students who registers for RSP in the respective semester



**NIRMA UNIVERSITY
INSTITUTE OF ARCHITECTURE & PLANNING
TEACHING AND EXAMINATION SCHEME**

**Bachelor of Architecture
SEMESTER VIII**

Course Code	Name of the Course	Teaching Scheme				Scheme of Examination				
						Duration		Component Weightage		
		L	T	P	C	SEE	LPW/PW	CE	LPW/PW	SEE
Core course										
2AR853	Urban Context Studio	-	-	12	8	-	-	0.6	0.4	-
2AR854	Research Seminar	2	-	1.5	3	3	-	0.6	0.4	-
2AR855	Introduction to Urban Planning	1	-	3	3	3	-	0.4	0.2	0.4
2ARS08	Related Study Programme #	(2/3 Weeks, Block course) (Minimum 21 days X 8 Hrs. = 168 Hrs.)			3	-	-	-	1	-
Institute Elective										
2ARE*	Elective*	2	-	1.5	3	-	-	0.6	0.4	-
2ARE*	Elective*	2	-	1.5	3	-	-	0.6	0.4	-
Total		7	-	19.5	20/23\$	-	-	-	-	-

L: Lecture,

T: Tutorial,

P: Practical,

C: Credit

CE: Continuous Evaluation,

LPW: Lab/Project/Studio Work,

SEE: Semester End Examination

#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester V and remaining 2 RSP before registration in Semester X.

\$ Credit of RSP will be given to those students who registers for RSP in the respective semester

* **Institute Elective Courses** (students have to register in course not taken in the previous semesters)

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-VII

L	T	P	C
-	-	12	8

Course Code	2AR753
Course Title	Urban context studio

Course Learning Outcomes (CLO):

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

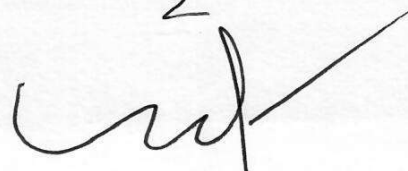
- Establish relationship of proposed project in the urban context
- Analyze institutional character, abstraction & design development
- Integrate building systems in the design
- Prepare detailed architectural design of the proposed building

Syllabus:

Total Teaching hours: 180 Hrs

Note: Following studio topics as mentioned below will be given as an optional module to students to choose in an urban context. Student can choose any one topic out of 4 topics that will be offered.

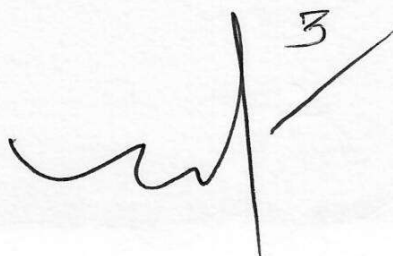
Unit No.	Syllabus: Topic	Studio / Sub Topic	Teaching hours:
I.	Service oriented building	Design development of structures and services of a complex building design. Relationship of different functional, service and movement areas for User group. Awareness and applications of Environmental Concerns and Energy Efficiency. Design Exercise : Design problem of a building involving a high level of services and advanced structural systems eg. Hotels, Health care like hospitals, clinics, asylum, Well being like spa, sauna, sports facility building, veterinary hospital etc.	180 hours
II.	Conservation / Reuse /Urban Insert	Urban Insert Developing the understanding of urban sector Issues regarding structure, building composition – its correlation with part and whole and infrastructure Building laws and controls, Building typology and morphology Principles of conservation and reuse of buildings in	180 hours

2


		<p>given context</p> <p>Building expressions in relation with tradition and modern times</p> <p>Urban insert, relationship of the proposed building to the surrounding builtform character</p> <p>Design Exercise: New building in historic context, conservation, reuse of building</p>	
III.	Layout and design commercial spaces	<p>B. Commercial Building</p> <p>Developing understanding of basic commercial building concepts in accordance with multi functionality of buildings.</p> <p>Methods of building with several combinations of materials.</p> <p>To integrate detailed requirements, careful site analysis and functional design to produce corporate identities and creative spirits.</p> <p>Introduction to urban development control regulation, codes and bye-laws.</p> <p>Design Exercise: The subject may include shopping complex, malls, Grocery stores, multiplex, office buildings etc.</p>	180 hours
IV.	Green building & Design of public spaces	<p>Design Exercise :Design involving Advance climatic responsive building, Green Rating building, Bio-mimicry, Mobile Building, Based on New material-strategy etc.</p> <p>C. Issue based or live project based</p> <p>D. Design Exercise: Involving Rehabilitation project, riverfront development, Lack front development etc.</p>	180 hours

Suggested Readings:

- Daniel Williams , "Sustainable Design: Ecology, Architecture & Planning" , John Wiley & Sons, 2007
- Lynch, Kevin, "The Image of the City", MIT Press, Cambridge, Mass., 1960.
- Krier, Rob, "Urban Space", Academy Editions, London,1967
- Koenigsberger, etal., "Manual of Tropical Housing & Building: Part I - Climatic Design", Orient Longman, Chennai , 1984.
- Evans, Martin, "Housing, Climate and Comfort". The Architectural Press, London, 1980
- Kishan, Baker and Szokolay, Climate Responsive Architecture. Tata McGraw Hill, 2002
- Charles correa, "A Place in the Shade: The New Landscape & Other Essays",2010
- Charles correa, "Housing and Urbanization",2000,Thames and Hudson
- Christopher Benninger,"Architecture to Modern India",2016
- Raj Rewal, "Humane Habitat at Low Cost: CIDCO, Belapur", New Mumbai,2000,



NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-VII

L	T	P	C
2	-	1.5	3

Course Code	2AR754
Course Title	Research Seminar

Course Learning Outcomes (CLO):

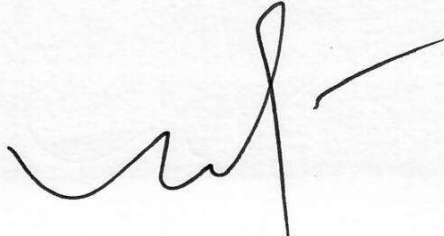
At the end of the course, students will be able to -

- Learn about various approaches to research in the field of Architecture
- Explore various aspects related to research
- Develop preliminary research proposal

Syllabus: 15 weeks X 3.5 hrs

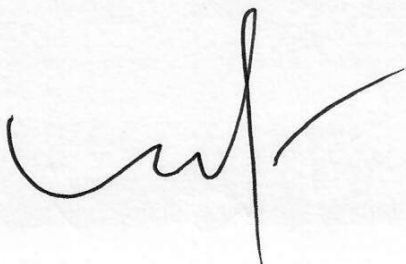
Total Teaching hours: 52.5 Hrs

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction to Research	<ul style="list-style-type: none"> • What is research? • Types of research. • Social research and Architectural research. 	7 hours
II.	Formation of research idea	<ul style="list-style-type: none"> • Literature Review • Formation of Aim and Objective. • Research scope and limitation. • Output of research. 	10.5 hours
III.	Data collection and Analysis	<ul style="list-style-type: none"> • Exploration of various ideas, on area of interests • Qualitative and Quantitative Research • Data collection – process and methods. • Analysis of data (Qualitative and Quantitative) 	10.5 hours
IV.	Report writing	<ul style="list-style-type: none"> • Lettering Styles. • Bibliography writing • Citation, etc. • Presentation technique 	10.5 hours
V.	Proposal Development	Developing the subject proposal <ul style="list-style-type: none"> • Literature • Aim and Objective • Data Requirement 	14 hours


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Suggested Readings:

- Hammon, Michal and Jerry Wellington .2013. Research Method :The key Concepts. New York :Routledge
- Creswell, John W. 2009. Research Design :Qualitative ,Quantitative and mix methods Approaches. 1000 oaks, SAGE
- Warburton, Nigel. 2006. The Basics of essay writing. New York: Routledge
- Turabian, Kate L 2007. A manual for Writer of Research Papers, Thesis and Dissertation, Seventh Edition Chicago: University of Chicago press.
- Wehrli, Robert, Environmental Design Research: How to Do It and How to Apply It, New York, Wiley: 1986
- Todd, Alden, Finding Facts Fast: How to Find Out What You want and Need to Know, Berkeley, Ten Speed Press: 1979
- Snyder, James, Architectural Research, New York, Van Nostrand Reinhold: 1984
- Zeisel, John, Inquiry by Design: Tool for Environment-Behavior Research, Cambridge, Cambridge University Press: 1981
- Sandoff, Henry, Visual Research Methods in Design, Van Nostrand Reinhold: 1991



NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-VII

L	T	P	C
1	-	3	3

Course Code	2AR755
Course Title	Introduction to Urban Planning

Course Learning Outcomes (CLO):

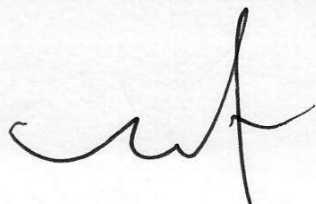
At the end of the course students will be able to –

- Understand the concept of urban planning.
- Gain knowledge of evolution of Human Settlements in history
- Apply the principles of physical planning in preparing settlement plan and Pattern of Urbanization

Syllabus: 15 weeks X 4hrs

Total Teaching hours: 60 Hrs

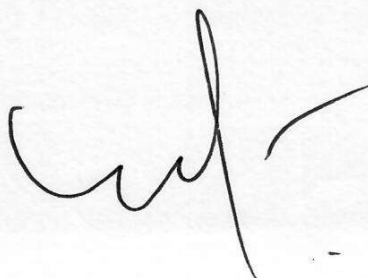
Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction to Urban planning	<ul style="list-style-type: none"> • Basic concepts of landuse planning – purpose, need and requirement; goals, objectives and principles • Determinants of landuse and planning process. • Population studies and forecasting. • Benefits of planning; Arguments for and against planning 	8 hours
II.	Theories of Urban planning	<ul style="list-style-type: none"> • Different theories and debates of landuse planning – Concentric Zone Theory, Isolate Estate Model, Sector Theory, Multiple Nuclei Theory etc.; • Landuse allocation models – William Alonso: Bid Rent Theory, etc. • Debates on landuse planning: transit oriented development, land use intensity and the size of the city, sprawl and compact urban form etc. 	12 hours
III.	Contemporary issues of Urban Planning	<ul style="list-style-type: none"> • Sustainability and rationality in planning • Components of sustainable urban and regional development • Landuse planning practices – Indian and global perspective. 	16 hours



IV.	Legislations and Regulations	<ul style="list-style-type: none"> • Land as a resource: Its character, potential Land value; drivers of demand for land on land market • Statues and laws governing land administration and management. • Urban landuse classifications • Different policies related to landuse and zoning, land suitability analysis etc. 	12 hours
V.	Governance of Planning	<ul style="list-style-type: none"> • Local government in India • District Planning Committees and Metropolitan Planning Committees; • ULC, Area/Urban Development Authorities 	12 hours

Suggested Readings:

- Alexander, Christopher, A pattern language. New York: Oxford University Press, 1977
- Edward. D. Mills , "Planning: The Architects' Hand Book ,Butterworth, London, 1985
- Krier, Rob, "Urban Space", Academy Editions, London,1967
- Chapin, F.S.; and Kaiser, E.J., (1979), "Urban Landuse Planning", University of Illinois, Urbana
- L.R. Kadiyali, (2014). "Traffic Engineering and Transport Planning", Khanna Publications, New Delhi
- P R. Berke and D R Godschalk, (2006). "Urban Landuse Planning", University of Illinois Press
- B.G. Hutchinson, (2011). "Principles of Urban Transport Systems Planning", McGraw Hill
- Dimitriou, T.H., (1990), (ed), "Transportation Planning for Third World Countries", Routledge, London
- Faludi, A., (1973), "Planning Theory", Pergamon Press, Oxford
- Faludi, A., "Three Paradigms of Planning Theory", pp. 81-101, in Healay, P.;
- Jain A K, (2010). "Urban Transport: Planning and Management", APH Publishing
- Kurt, Leibrant., (1970), "Transportation and Town Planning"
- C. S Papacostas, and P. D Prevedouros, "Transportation Engineering and Planning", PHI Learning
- D. Mohan, (2013). "Safety, Sustainability and Future Urban Transport", Eicher Goodearth Limited, New Delhi
- Field B.G., and MacGregor, B.D., (1987), "Forecasting Techniques for Urban and Regional Planning", Hutchinson, London
- McDougall, G., and Thomas, M.J., (eds), (1982), "Planning Theory : Prospects for the 1980's", Pergamon Press, London



NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-VII

L	W	S	C
-	-	-	3

Course Code	2ARS07
Course Title	Related Study Programme (RSP)

Course Learning Outcomes (CLO):

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

- Get exposure to various built environment at different places of architectural relevance across the state, region, country and the world.
- Apprise the relevance of built environment by observing & photo documentation of selected places.

Syllabus: 3 Weeks X 42 Hours/Week

Total Teaching hours: 126 Hrs

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Multidisciplinary study of parts of urban structures, planning, regulations, building, landscape, conservation issues, study analysis, development proposals	<ul style="list-style-type: none"> • Student and faculty members stay at the selected city/ metro city for 8 to ten days. • Students will get comprehensive awareness of the city/ metro city. • Students will explore the built environment in terms of Social, educational, political institutes, settlement pattern etc. • Students will understand the typology, design style, material-construction system, etc. • Students will also documents the social, cultural, environmental aspects of that city/ metro city 	90 hours
II.	Compilation and documentation	<ul style="list-style-type: none"> • Students came back at institute and make the final Documentation report within remaining days. 	36 hours

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-VIII

L	T	P	C
-	-	-	24

Course Code	2AR850
Course Title	Professional Training

Course Learning Outcomes (CLO):

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

- Get exposure to architectural professional practice
- Learn and coordinate with consultants/ various agencies for the preparation and execution of design
- Understand office organization

Syllabus: 18 weeks (Minimum)

Total Teaching hours: Not applicable

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours.
1.	Professional Training	Organization of office, client contact & presentation, processes of design development, working drawings, Sanction Drawing, contracts, exposure to consultants, understanding of impact of costs on building design, site supervision.	18 weeks (Minimum)

Suggested Readings:

Not applicable



10

343
343

NU/AC/AC-160620/9(C)/20- 24
Date: 24.07.2020



NOTIFICATION

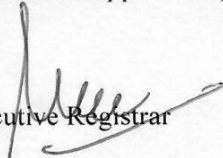
- Read: 1. **R-44 – empowering Academic Council to approve teaching & examination scheme, syllabi, etc published vide notification No. NU-442 dated 27.01.2004 (as amended)**
2. **Notification No. NU-67 dated 11.05.2017 - Introduction of Teaching & Examination Scheme and Syllabus of Semester-VII and VIII of B.Arch. programme**
3. **Notification No. NU-177 dated 20.12.2018 - Revision in Teaching and Examination Scheme of Semester-I to X of B.Arch. programme due to offering of Related Study Programme (RSP) as option**
4. **Resolution No. 3(C) – Faculty of Architecture & Planning meeting – 03.03.2020**
5. **Resolution No. 9(C)– Academic Council meeting – 16.06.2020**
6. **Approval of the Director General on note-dated**

Sub: **Revision in the Teaching and Examination Scheme and Syllabi of Semester–VII to X of B.Arch. programme**

It is hereby notified for information of all concerned that the Academic Council in its meeting held on 16.06.2020 under resolution No. 9(C) in exercise of powers conferred upon it by the Board of Governors under regulation mentioned at serial 1 above and taking into consideration the recommendation of the Faculty of Architecture & Planning, has resolved to approve *revision* in the Teaching and Examination Scheme and Syllabi of Semester–VII to X of B.Arch. programme, to be made effective for the students to be registered in respective semester in the academic year 2020-21 only due to the COVID-19 Pandemic:

- i. Swapping of all courses of ‘Semester–VII’ to **Semester-VIII**
- ii. Amendment in the Institute Elective courses due to updation of course codes, credit and examination scheme

It is further notified that the Director General was authorized to approve the revised document incorporating the suggestions made by the Academic Council and the final document as approved by the Director General is attached herewith as **Appendix-A**.


Executive Registrar

Encl.: Appendix-A [Pages 1 to 58]



To,
1. Dean, Faculty of Architecture & Planning
2. Dy. Registrar (Exam)

Copy to,
1. Exam Sec.
2. OS
3. Library
4. P.A. to ER

c.f.w.cs. to Director General

INSTITUTE OF ARCHITECTURE and PLANNING

NIRMA UNIVERSITY

TEACHING AND EXAMINATION SCHEME

Name of the Programme: Bachelor of Architecture

SEMESTER IX

Course Code	Name of the Course	Teaching Scheme				Credit	Hours	Scheme of Examination		
		Hours/ Week			C			SEE	Component Weightage	
		L	T	P		SEE	CE		LPW	
CORE COURSES										
2AR952	Architectural Design Studio - IX	-	-	18	12	-	-	0.6	0.4	
2AR953	Research Proposal	-	-	6	4	-	-	0.6	0.4	
2ARS09	Related Study Programme (RSP) #	(2/3 Weeks, Block course) (Minimum 21days X 8 Hrs. = 168 Hrs.)			3	-	-	-	1	
ELECTIVE COURSES										
2ARE*	Elective*	2	-	1.5	3	-	-	0.6	0.4	
Total		2	-	25.5	19/22\$	-	-	-	-	

L: Lecture,

T: Tutorial,

P: Practical,

C: Credit

CE: Continuous Evaluation,

LPW: Lab/Project/Studio Work,

SEE: Semester End Examination

#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester V and remaining 2 RSP before registration in Semester X.

\$ Credit of RSP will be given to those students who registers for RSP in the respective semester

* Institute Elective Courses as per Annexure-I (Students have to register in course not taken in the previous semesters)

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-IX

L	T	P	C
-	-	18	12

Course Code	2AR952
Course Title	Architectural Design Studio - IX

Course Learning Outcomes (CLO):

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

- Formulate design programme/proposal based on live or hypothetical architectural projects and concerns
- Create Environmental design and experiences based on Architectural theory, approaches, process, techniques and methods
- Design appropriate and innovative Architectural Solution for environmental, technological, social, economic and cultural context

Syllabus: 15 weeks (18 hours/week)

Total Teaching hours: 270 Hrs.

Unit no.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Identify and formulate design project based on concerns and issues	<p>Students can select projects of varied nature like commercial, institutional, mass housing, recreational, transportation, entertainment, etc.</p> <p>Students realise their own design capacity, capability and inclination and choose/select their design project based on that.</p> <p>Choice of live project with proposed site and programme or hypothetical project with appropriate site.</p> <p>Programme formulation with all necessary components and area requirements</p> <p>Site selection/identification based on typical</p>	2 weeks

		characteristics of the site or location in the region, city, etc.	
II.	Data collection, research, analysis and synthesis	<p>Study of climate, topography, landscape and other site characteristics</p> <p>Study of cultural, historical, social, political aspects of programme and site</p> <p>Understanding components of the programme and their interrelationships.</p> <p>Doing case-studies to understand how architectural design incorporates the above mentioned aspects of site, programme, culture, etc</p> <p>Adoption of a multidisciplinary approach to understand how aspects like economics, society, culture, climate, philosophy, etc affect architectural design and thereby evolve a design strategy.</p>	4 weeks
III.	Formulate and follow a Design process and methodology	<p>Evolve architectural design from ideas, concepts, theories, processes, etc</p> <p>Produce a coherent, imaginative and innovative design entity</p> <p>Architectural design to be demonstrate good response to site, culture and society.</p> <p>Develop an architectural language based on design response to climate, construction technology, programme, site characteristics, etc</p>	6 weeks
IV.	Incorporation of building construction technologies and systems	<p>Appropriate choice and use of building construction materials for buildings structures</p> <p>Incorporation of various services like toilets, HVAC, components of horizontal and vertical circulation, etc in design</p> <p>Articulation of design and detailing for efficient functioning of various spaces of inside, outside and inbetween environments.</p>	3 weeks

Note:

- Students will communicate & present their design and process stagewise, through appropriate and relevant sketches, drawings, models, 3d images, diagrammes, etc.
- 18 hours of contact time per one week includes time for lectures, discussions between students and teachers, interim reviews, site visits and visits for data collection.
- The actual association hours in college will be only 9 hours out of 18 hours and rest would be utilised for site visit and field work

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-IX

L	T	P	C
-	-	6	4

Course Code	2AR953
Course Title	Research Proposal

Course Learning Outcomes (CLO):

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

- Understand the basic research theories of architecture
- Imbibe the principles of a research topic with reference to architectural research
- Create a research proposal to continue research in the next semester
- Evaluate and analyze the current research methods for application to one's own research

Syllabus: 15 weeks (06 hours/week)

Total Teaching hours: 90 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Content	<ul style="list-style-type: none"> • Overview of current research trends in architecture • Study some research methods in detail • Finalize the research method that relates the most to the current research undertaken • Prepare a research proposal 	3 weeks 3 weeks 4 weeks 5 weeks

Suggested Readings:

- Rybczynski, W. (2003). The perfect house: a journey with the Renaissance architect Andrea Palladio. New York: Scribner.
- Andreotti, L., & Lahiji, N. (2017). The architecture of phantasmagoria: specters of the city. London; New York: Routledge.
- Forty, A. (2013). Words and buildings: a vocabulary of modern architecture. London: Thames & Hudson.
- Groat, L., & Wang, D. (2013). Architectural Research Methods. Hoboken: Wiley.
- Lucas, R. (2016). Research Methods for Architecture. Laurence King.
- Manuel, F. E., & Manuel, F. P. (1997). Utopian thought in the western world. Cambridge, MA: Belknap.
- Mitrovic, B. (2011). Philosophy for architects. New York: Princeton Architectural Press.
- Sarvimäki, M. (2018). Case study strategies for architects and designers: integrative data research methods. New York, NY: Routledge.
- Smith, K. H. (2012). Introducing architectural theory: debating a discipline. New York: Routledge.

INSTITUTE OF ARCHITECTURE and PLANNING

NIRMA UNIVERSITY

TEACHING AND EXAMINATION SCHEME

Name of the Programme: Bachelor of Architecture

SEMESTER X

Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination		
		Hours/ Week			Credit		SEE	Component Weightage	
		L	T	P	C	SEE		CE	LPW
CORE COURSES									
2AR1052	Research Thesis	-	-	24	16	-	-	0.6	0.4
2AR1053	Professional Practice	-	-	3	2	-	-	0.6	0.4
2ARS10	Related Study Programme (RSP) #	(2/3 Weeks, Block course) (Minimum 21days X 8 Hrs. = 168 Hrs.)			3#	-	-	-	1#
ELECTIVE COURSES									
2ARE*	Elective*	2	-	1.5	3	-	-	0.6	0.4
Total		2	-	28.8	21/ 24§	-	-	-	-

L: Lecture,

T: Tutorial,

P: Practical,

C: Credit

CE: Continuous Evaluation,

LPW: Lab/Project/Studio Work,

SEE: Semester End Examination

#4 RSP is to be completed during the entire duration of B.Arch programme out of which 2 RSP is to be completed before registration in Semester V and remaining 2 RSP before registration in Semester X.

§ Credit of RSP will be given to those students who registers for RSP in the respective semester

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-X

L	T	P	C
-	-	24	16

Course Code	2AR1052
Course Title	Research Thesis

Course Learning Outcomes (CLO):

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

- Design a research plan
- Develop and finalize the research question
- Investigate the research question under guidance of the faculty
- Creating the final research document as a dissertation thesis and present the outcomes to the research committee

Syllabus: 15 weeks (24 hours/week)

Total Teaching hours: 360 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Content	<ul style="list-style-type: none"> • Designing the research plan • Developing the research questions • Investigation of the idea and final outcomes 	3 weeks 3 weeks 9 weeks

Note:

- Students will communicate & present their design and process stagewise, through appropriate and relevant sketches, drawings, models, 3d images, diagrammes, etc.
- 24 hours of contact time per one week includes time for lectures, discussions between students and teachers, interim reviews, site visits and visits for data collection.
- The actual association hours in college will be only 12 hours out of 24 hours and rest would be utilised for site visit and field work

Suggested Readings:

- Rybczynski, W. (2003). *The perfect house: a journey with the Renaissance architect Andrea Palladio*. New York: Scribner.
- Andreotti, L., & Lahiji, N. (2017). *The architecture of phantasmagoria: specters of the city*. London; New York: Routledge.
- Forty, A. (2013). *Words and buildings: a vocabulary of modern architecture*. London: Thames & Hudson.
- Groat, L., & Wang, D. (2013). *Architectural Research Methods*. Hoboken: Wiley.
- Lucas, R. (2016). *Research Methods for Architecture*. Laurence King.
- Manuel, F. E., & Manuel, F. P. (1997). *Utopian thought in the western world*. Cambridge, MA: Belknap.
- Mitrovic, B. (2011). *Philosophy for architects*. New York: Princeton Architectural Press.
- Sarvimäki, M. (2018). *Case study strategies for architects and designers: integrative data research methods*. New York, NY: Routledge.
- Smith, K. H. (2012). *Introducing architectural theory: debating a discipline*. New York: Routledge.

NIRMA University
Institute of Architecture and Planning
Bachelor of Architecture
Semester-X

L	T	P	C
-	-	3	2

Course Code	2AR1053
Course Title	Professional practice

Course Learning Outcomes (CLO):

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

- Student will understand the professional, vocational and legal aspects of architectural practice
- Student will achieve the understanding of the code of professional conduct and law regarding the Architectural profession.
- Students will be prepared for the professional practices.

Syllabus: 15 weeks (3 hours/week)

Total Teaching hours: 45 Hrs

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Role of an architect, responsibilities and liabilities	<ul style="list-style-type: none"> • Profession vocation, trade union vis-à-vis professional activities, social obligations of profession, architectural professional association and its role and responsibilities.(IIA) • Architects Act 1972/87. Council of Architecture, its role and responsibilities.(COA) • Professional Ethics 	3 weeks
II.	Work and Scale of professional charges, mode of working and payments	<ul style="list-style-type: none"> • Code of professional conduct. • Condition of engagement and scale of professional fees. • Copyright Act as applicable to architectural work. • Architectural competitions 	2 weeks
III.	Contract document and article of	<ul style="list-style-type: none"> • Concept of Contract. • Duties and liabilities of architects, duties 	3 weeks

	agreement	<ul style="list-style-type: none"> and liabilities of contractors. Articles of agreement, execution of works and payments. Arbitration, Act, its applications, and its scope. Laws pertaining to property matters like Right of easements, etc. 	
IV.	Tendering	<ul style="list-style-type: none"> Tender types and the process of calling, security and selection system. Office organizations and management, expense, structure of, salaries and overheads. Role of design staff and supporting staff; Personal management and training responsibilities. 	3 weeks
V.	Valuation of properties	<ul style="list-style-type: none"> Introduction to Valuation. Role of Valuers Types , methods and importance of valuation 	2 week
VI.	Office management	<ul style="list-style-type: none"> Arbitration- settling of disputes etc Assignments and other task of professional antiquates 	2 week

Suggested Readings:

- Madhav Devbhakta. Architectural Practice in India, Council of Architecture, 2007
- Apte V S, Architectural Practice and Procedure Mrs. Padmaja Bhide (Pune),2008
- Handbook on professional practice-IIA
- Handbook of Professional Documents-COA
- James Franklin, Architect's Professional Practice Manual McGraw-Hill Education, 30-Mar-2000
- The Architect's Handbook of Professional Practice, John Wiley & Sons, 11-Jan-2013

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Annexure-I

Institute Elective Courses as per Annexure-I:

Code	Elective	Code	Elective
2ARE51	Introduction to Environmental Planning	2ARE61	Site & Project management
2ARE52	Real Estate Planning	2ARE62	Mass media studies
2ARE53	Valuation	2ARE63	Alternative construction techniques
2ARE54	Intelligent Buildings	2ARE64	Reuse of building material
2ARE55	Architectural Journalism	2ARE65	Barrier free design
2ARE56	Architectural Criticism	2ARE66	Advanced computer application in Design – I
2ARE57	Ecology and Bio-diversity	2ARE67	Introduction to GIS
2ARE58	Heritage Conservation	2ARE68	Design with Ferro-cement
2ARE59	Retrofitting of Buildings	2ARE69	Lightweight Structure
2ARE60	Conservation Techniques	2ARE70	Advanced Computer Application in Design – II (Digital Fabrication)
		2ARE71	Introduction to Infrastructure Planning

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L	T	P	C
2	-	1.5	3

Course Code	2ARE51
Course Title	Introduction to Environmental Planning

Course Learning Outcomes (CLO):

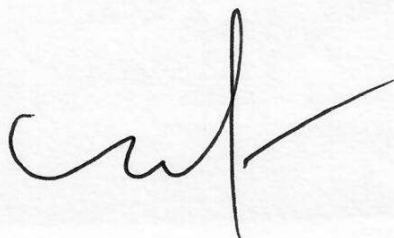
At the end of the course, students will be able to -

- Understand the new environmental problems including the Global and Local issues
- Learn environment as agent in the transformation of human settlement
- Comprehend importance of sustainability & new approaches to tackle environmental issues.

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Concept of environmental planning	<ul style="list-style-type: none"> • Concepts of Environmental Planning, History of Environmental Planning, Development of habitat patterns, settlement structure and form in response to environmental challenges. 	9 hours
II.	Ecology and ecosystem	<ul style="list-style-type: none"> • Concepts of Ecology and Ecosystem • Resource analysis for various ecosystems and development imperatives (land, geology, soil, climate, water, vegetation) characteristics, exploitation, causative factors for degradation, analytical techniques. • Urban Ecosystem • Environmental Zones (Hill, coastal, arid, characteristics, resources, settlements pattern, problems and potentials, regulating mechanisms for development. 	17 hours
III.	Legislative framework	Environmental Policies and initiatives including policies, strategies, protocols, treaties and agreements	17.5 hours
IV.	Case studies	Various assignment and case-study discussion	9 hours



Suggested Readings:

- Ian L. McHarg .Design with Nature
- Prasad .Environment, Development and Society in Contemporary India: An Introduction
- Starke, Barry .Landscape Architecture: A Manual of Environmental Planning And Design;
- Dhameja S.K., "Environmental Studies"
- Roorda N. et.al. (2012). "Fundamentals of Sustainable Development". Routledge
- Wheeler A., Beatley T., "Sustainable Urban Development Reader". Routledge, 2014
- Dara, S.S., A Text Book on Environmental Chemistry and Pollution Control, S.Chand & Company, New Delhi, 2007
- Malcolm D. Climate Change & Sustainable Development, Routledge, New York, 2008
- Odum, E.P., Barrett, G.W., Brewer, R., Fundamentals of Ecology, Thomson Brooks,
- Westman W., John Wiley and Sons, Ecology, Impact Assessment and Environmental Planning.
- Integrated Environmental Planning, James K. Lein, Blackwell Publishing
- AITP Reading Material on Environmental Planning and Design, Prof A. K. Maitra, SPA Delhi
- Ecology and Equity - The Use and Abuse of Nature in Contemporary India, Gadgil, M. and Guha, R., Penguin, 1995
- Environment and Development : The Place of Human Ecology in South Asian Studies Programme, Rambo, T.
- Environment Crisis and Sustainable Development, Bahuguna, S., Natraj, Dehradun,
- Environmental Issues and Researches in India, Agarwal, S.K. and Garg, R.K (eds), Himanshu Publications
- Environmental Law and Policy in India - Cases Materials and Statutes, Divan, S. and Roseneranz A., Oxford
- Environmental Problems in Third World Cities, Hardoy, J.E., Mitlin, D., and Satterthwaite J.D., Earthscan
- Our Common Future: The World Commission on Environment and Development, Oxford University Press, Oxford, New York

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L	T	P	C
2	-	1.5	3

Course Code	2ARE52
Course Title	Real Estate Planning

Course Learning Outcomes (CLO):

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

- Understand the importance of Real Estate.
- Comprehend legal terminologies used in the field of Real Estate.
- Develop critical understanding of property market

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus Topic	Sub Topic	Teaching hours
I.	Importance of Real estate	<ul style="list-style-type: none"> • Introduction to the Real Estate Business • Nature and Description of Real Estate • Effective ways to manage, administer and sell property owned by another party or entity 	3 hours
II.	Marketing and financial aspects	<ul style="list-style-type: none"> • Legal Aspects of Real Estate including Property Documentation • Real Estate Marketing, Sales & Brokerage • Planning, Zoning & Development • Case Studies 	9 hours
III.	Property Administration	<ul style="list-style-type: none"> • legal issues of real estate financing with an emphasis on commercial transactions. • Understand the rights and responsibilities of different stakeholders 	7 hours
IV.	Classification of ownership, Tenant and occupancy	<ul style="list-style-type: none"> • Mortgage • Freehold property • Leasehold property • Easements • Case Studies 	12 hours
V.	Valuation	<ul style="list-style-type: none"> • Land valuation and market demand • Housing Finance, Property Valuation & Taxation • Transactions related to NRIs/PIOs • Case Studies 	11 hours
VI.	Taxation in Real Estate	<ul style="list-style-type: none"> • Income Tax, Service Tax, Wealth Tax, Property Tax, Tax Implication for NRIs/PIOs. 	10.5 hours

Suggested Readings:

- Roshan Namavati.
- Manohar N. Dange. 1973. Valuation of Immovable Properties, the University of Virginia
- Talamo, The Real Estate Dictionary, fourth edition.
- Girish C. Gupta. 2000. Valuation of Immovable Properties under Direct Taxes
- Rangwala. 2015. Valuation of Real Properties
- Brandon Turner. The Book on Rental Property Investing
- Spencer Strauss. The Unofficial Guide to Real Estate Investing
- Real Estate Regulatory And Development Act – 2016 (RERA)

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L	T	P	C
2	-	1.5	3

Course Code	2ARE53
Course Title	Valuation

Course Learning Outcomes (CLO):

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

- Understand various approaches to valuation
- Learn about various techniques used in the field of valuation
- Integrate the valuation techniques with architectural practice

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction to Valuation	<ul style="list-style-type: none"> • Definition and its importance • Cost, Price and Value • Importance of valuation • Purpose of Valuation 	5 hours
II.	Approaches to value	<ul style="list-style-type: none"> • Cost approach • Sales comparison approach • Income approach • Case study discussion and Assignment 	9 hours
III.	Value classification	<ul style="list-style-type: none"> • Assessed value • Book value • Salvage value • Scrape value • Replacement value • Earning value • Potential value • Distress value • Speculative value • Monopoly value • Sentimental value 	13 hours
IV.	Method of Valuation	<ul style="list-style-type: none"> • Land and building method • Rent capitalization method • Profit capitalization method • Development potential method • Direct comparison method 	19 hours
V.	Classification of ownership	<ul style="list-style-type: none"> • Mortgage • Freehold property • Leasehold property 	5 hours
VI.	Easements	<ul style="list-style-type: none"> • Dominant and servant owner • Characteristic of an easement 	1.5 hours



Suggested Readings:

- Roshan Namavati.
- Manohar N. Dange. 1973. Valuation of Immovable Properties, the University of Virginia
- Ministry of finance government of india 2009 .Incomtax Department,Guide lines for valuation of immovable properties
- Girish C. Gupta, 2000. Valuation of Immovable Properties under Direct Taxes
- Rangwala, 2015. Valuation of Real Properties

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L	T	P	C
2	-	1.5	3

Course Code	2ARE54
Course Title	Intelligent Buildings

Course Learning Outcomes (CLO):

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

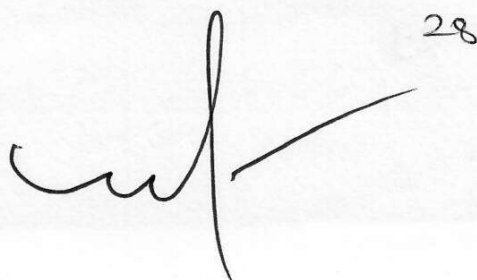
- Understand the concept of intelligent buildings.
- Explore features of intelligent buildings and service systems.
- Develop the capacity of Experiencing Space in Time & Motion.

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours
I.	Intelligent building characteristics:	- Features and benefits of intelligent buildings. - The anatomy of intelligent buildings. - Environmental aspect. - The marketplace and other driving forces behind the emergence of intelligent buildings.	10 hours
II.	Building automation systems & controls	- Philosophy, system configuration, system modules, distributed systems, communication protocol and on-line measurements. - Fire protection, security and energy management. Control objectives, Sensors, controllers and actuators. Control system schematics system design. Microprocessor based controllers & digital controls. Examples of sub-systems such as: Digital - Addressable Lighting Interface (DALI)	13 hours
III.	Modern intelligent vertical transportation systems:	-Sky lobby, double-deck lifts, twin lifts, advanced call registration systems, large scale monitoring systems, applications of artificial intelligence in supervisory control, energy saving measures related to lift systems/escalator systems, other modern vertical transportation systems such as: gondola systems, materials handling systems, etc.	10 hours
IV.	Communication and security systems:	-Voice communication systems, local area network, wireless LAN, - Digital TV, CCTV, digital CCTV teleconferencing, cellular phone system, and CABD, SMATV, Data networking, Short- and long-haul, networks. - -Wideband network, Office automations.	13 hours

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		Public address/sound Reinforcement systems. Digital public address system. Modern security systems	
V.	Structured cabling systems:	Characteristics and benefits. Standards, configurations and physical media. EMI/EMC issues, grounding problems. System design. Different Categories of cables.	5 hours
VI.	Integrating infrastructure technologies and systems:	The impact of information technology on buildings and people. Shared tenant services. Interaction and integration between building structure, systems, services, management, control and information technology. Application & design software packages.	1.5 hours

Suggested Readings:

- Horne R., Grant T., Verghese K.: LIFE CYCLE ASSESSMENT – Principles, Practice and Prospects. CSIRO PUBLISHING, Horne, Grant and Verghese 2009, Collingwood VIC 3066, Australia
- Clements-Croome, Derek, Intelligent Buildings: An introduction, Routledge, 2014
- Shengwei Wang, Intelligent Buildings and Building Automation, Spon Press, 2010
- Jim Sinopoli, Smart Building Systems for Architectures, Owners and Builders, Elsevier, 2010
- P. Manolescuc, Integrating Security into Intelligent Buildings, Cheltenham, 2003
- A. Dobbelsteen, Smart Building in a Changing Climate, Techne Press, 2009
- D. Clements-Croome, Intelligent Buildings: An Introduction, Routledge, 2014
- A. Oliviero, Cabling [electronic resource]: The Complete Guide to Copper and Fiberoptic Networking, John Wiley & Sons, 2014
- W.T. Grondzik, & A.G. Kwok, Mechanical and Electrical Equipment for Buildings, Wiley, 2015

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L	T	P	C
2	-	1.5	3

Course Code	2ARE55
Course Title	Architectural Journalism

Course Learning Outcomes (CLO):

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

- Established the concept of journalism in the field of Architecture
- Apprise the role of architectural journalism in identifying and formulating relevant buildings
- Develop the capacity to write critics on selected projects

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction To Journalism	Concept of Journalism, Definition, History	14 Hours
II.	Fundamentals of Journalism	Advantages of Journalism, concept of Ethical journalism, Journalism in design field	17.5 hours
III.	Role of Journalism in general & in design field	Case Studies –Global & Local, Short Project	21 hours

Suggested Readings:

1. Al-Asad, M., & Musa, M. (2006). Architectural criticism and journalism: global perspectives: proceedings of an international seminar organised by the Aga Khan Award for Architecture in association with the Kuwait Society of Engineers. 6-7 December 2005, Kuwait. Turin, Italy: Umberto Allemandi & C. for Aga Khan Award for Architecture
2. Allan, S. (2010). The Routledge companion to news and journalism. New York, NY: Routledge.
3. Booth, G. G. (1918). The spirit of journalism and architecture. Place of publication not identified.
4. Franklin, B. (2005). Key concepts in journalism studies. London: SAGE.
5. Harcup, T. (2004). Who, what, where, when, why and how?: an introduction to journalism. London: Sage.
6. Willis, J. (1990). Journalism: state of the art. New York: Praeger.



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L	T	P	C
2	-	1.5	3

Course Code	2ARE56
Course Title	Architectural Criticism

Course Learning Outcomes (CLO):

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

- Explore relationship between design philosophies
- Examine theoretical concepts and its application in design
- Analyze and develop critical viewpoint on built works and present day practices

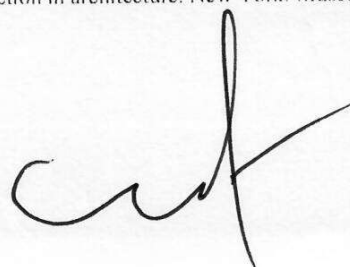
Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Essay writing	<ul style="list-style-type: none"> • Book Review • Relation to design philosophy 	9 Hours
II.	Critical Reading	<ul style="list-style-type: none"> • Critical assessment of articles/readings on different design philosophies 	11 Hours
III.	Design statement	<ul style="list-style-type: none"> • Individual approach and philosophy of design and role of design in creating better built environment. • Design ideology that closely corresponds to one's own philosophy about design. 	14 Hours
IV.	Integrative Studio	<ul style="list-style-type: none"> • Descriptive writing • Analysis of studio projects • Visual components of design • Representation of design project in terms of writing and communication 	18.5 Hours

Suggested Readings:

- Le Corbusier. (1986). Towards a New Architecture. Mineola: Dover Publications
- Aldo Rossi. The Architecture of the City
- K. Michael Hays. (2000). Architecture Theory Since 1968. New York: Columbia Books of Architecture
- Stephen A. Kliment. (1998). Writing: For Design Professionals. New York City: W. W. Norton & Company
- Venturi, R., & Museum of Modern Art (New York, N.Y.). (1966). Complexity and contradiction in architecture. New York: Museum of Modern Art.



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L	T	P	C
2	-	1.5	3

Course Code	2ARE57
Course Title	Ecology and Bio diversity

Course Learning Outcomes (CLO):

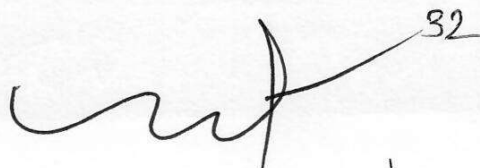
At the end of the course, students will be able to -

- Understand major ecological issues related to human settlement.
- Learn about major ideas of natural selection, ecology, community, biodiversity, climate change and sustainability
- Formulate ecological basis of architectural design

Syllabus: 15 weeks (3.5 hours/week)

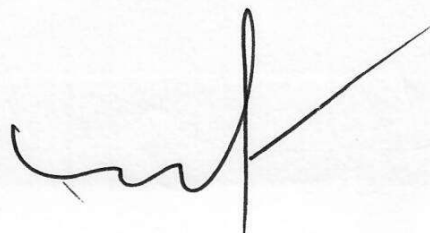
Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction to Ecology	<ul style="list-style-type: none"> • Discussion and discourse on assessing the Value of Ecosystem and Ecosystem Services 	4 Hours
II.	Interaction in Ecological community	<ul style="list-style-type: none"> • Time problem – Based on population and prediction of change over time – assess the prediction based on based on their ecological logic and feasibility. 	7 Hours
III.	Ecological cycle	<ul style="list-style-type: none"> • Inter-relationships between ecological cycles • Discuss how ecological flows are inter-related and compare and contrast different ways of representing information on a concept map. 	7 Hours
IV.	Biodiversity	<ul style="list-style-type: none"> • Explore the connection between the biodiversity of different ecosystems, various ecosystem services, and measures of human well-being. 	13 Hours
V.	Understanding Climate Change, Urban ecology and sustainability	<ul style="list-style-type: none"> • Identify the major human activities that contribute to climate change; List and categorize different ways that we might reduce the contribution of human activities to climate change. • Assessing the sustainability of our city and developing a perspective on becoming ecologically sustainable 	10 Hours
VI.	Impact of Architectural Design on sustainability	<ul style="list-style-type: none"> • Exploring Building Life Cycle Assessment though digital and physical models 	11.5 Hours

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Suggested Readings:

- Sharma P. D., (2009), Ecology And Environment, Rastogi Publications.
- Saligram Bhatt, (2004), Environment Protection and Sustainable Development, APH Publishing.
- Francisco A. Comin, (2010), Ecological Restoration: A Global Challenge, Cambridge University Press.
- D. D. Khanna, (1997), Sustainable development: environmental security, disarmament, and development interface in South Asia, Macmillan India.
- Tony Fry, (2009), Design Futuring: Sustainability, Ethics and New Practice, Berg, - Architecture.
- Marina Alberti, (2007) Advances in Urban Ecology: Integrating Humans and Ecological Processes in Urban Ecosystems, Springer.
- John M. Marzluff, (2008), Urban Ecology: An International Perspective on the Interaction Between Humans and Nature, Springer.
- P.K. Gupta, (2011), Methods in Environmental Analysis, Agro bios.



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L	T	P	C
2	-	1.5	3

Course Code	2ARE58
Course Title	Heritage Conservation

Course Learning Outcomes (CLO):


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

- Student will develop sensitivity towards built heritage
- Student will develop capacity of Critical appraisal of the status of buildings

Syllabus: 15 weeks (3.5 hours/week)
52.5 Hr

Total Teaching hours:

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction to Architectural conservation	heritage, Conservation, etc... terms associated with subject for initial study	4 hour
II.	Causes of Decay	<ul style="list-style-type: none"> • Climatic causes • Biological causes • Manmade causes Case study presentation to explain the same	7 hour
III.	Conservation procedures and framework	<ul style="list-style-type: none"> • Inventory preparation, listing and grading of heritage building • Documentation • Degrees of Intervention • Prevention, Preservation, Consolidation, restoration • Rehabilitation, Reuse, Reproduction, Reconstruction etc... 	12 hour
IV.	Legislation, Policy and guidance	<ul style="list-style-type: none"> • Role of UNESCO • Role of National Level Bodies: INTACH, ASI, State Govt. Dept. of Archaeology • Role of local bodies 	8 hour
V.	Conservation of materials	<ul style="list-style-type: none"> • Earthen structures • Timber, Stone, Thatch • Structural metal, Finishes, Glass, etc... 	8 hour



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8-13

VI.	Conservation of Historic buildings	Case Studies: <ul style="list-style-type: none"> • Hagia Sophia, Istanbul, Turkey • Roman Theatre and the "Triumphal Arch" of orange, France • Temple of Ramses II at Abu Simbel, Egypt • Temple of Angkor Wat and Ta-Prohm, Cambodia • Taj Mahal, Agra • Qutub Minar, Delhi • Monuments of Champaner, Vadodara • Humayun's Tomb, Delhi 	8 hours
VII.	Test and other Assignment discussion in class	Various assignment and case-study discussion will be conducted during sessions	5.5 hours

Suggested Readings:

- N. L. Batra. Heritage conservation: preservation and restoration of monuments. Aryan Books International, 1996
- Robert A. Young. Historic Preservation Technology (New York, John Wiley & Sons, 2008)
- Robert E. Stupe, ed. A Richer Heritage: Historic Preservation in the Twenty-First Century. Chapel Hill: University of North Carolina Press, 2003.
- Owen Hopkins. Reading Architecture: A Visual Lexicon. London: Laurence King Publishing, 2012.
- Sir Bernard Fieldon. A Technical Manual
- Jukka Jokilehto. A History of Architectural Conservation
- Sir John Marshall. Conservation Manual
- All Charters by UNESCO
- Tilley, Chris. Handbook of Material Culture (2006)
- Dan Hicks. Mary C. Beaudry. The Oxford Handbook of Material Culture Studies (2010)
- Henry H. Glassie. Material culture. (1999).
- Aldo Rossi. Architecture of the city
- John Ruskin. Seven Lamps of Architecture
- Robert Ventury. Complexities and contradiction in architecture
- John Summerson. Classical Language of Architecture
- Hanno-Walter. A History of Architectural Theory – From Vitruvius to present day
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties by ICOMOS
- Handbook on seismic retrofit of Buildings by CPWD, Chennai
- Between two earthquakes – cultural property in seismic zones by Bernald Fieldon

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L	T	P	C
2	-	1.5	3

Course Code	2ARE59
Course Title	Retrofitting of buildings

Course Learning Outcomes (CLO):

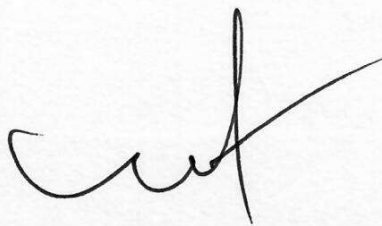
At the end of the course, students will be able to -

- Survey and assess structural condition of buildings.
- Learn about various retrofitting techniques
- Plan and execute the processes of retrofitting to have a structurally stable buildings.

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Fundamentals of retrofitting	<ul style="list-style-type: none"> • Introduction to retrofitting • Terminology, definition and methods 	8.5 hours
II.	Retrofitting techniques	<ul style="list-style-type: none"> • Discussion of different retrofitting techniques Case study and presentation to explain the same	12.5 hours
III.	Establish scope of safety / risks	<ul style="list-style-type: none"> • Identify hazards at the worksite, assess risks and implement control measures. • Use information from safety data sheets and organisational safe work method. 	11 hours
IV.	Plan and prepare for retrofitting of structures	<ul style="list-style-type: none"> • Plan the retrofitting activity in accordance with all current legislative, regulatory and organizational requirements. • Identify the work to be undertaken • Explain government initiatives applicable to the retrofitting to the owner/occupier. • Complete risk assessments and follow safe work practices and emergency procedures. • Identify appropriate materials • Clean the work area and recycle or dispose of all waste materials. 	20.5 hours



Suggested Readings:

- Central public works department & Indian building congress (2007). *Handbook on seismic retrofit of buildings*. Madras, India: Indian Institute of Technology.
- Paquette, J., Bruneau, M., and Brzev, S. (2004). Seismic Testing of Repaired Unreinforced Masonry Building Having Flexible Diaphragm. *Journal of Structural Engineering*. ASCE, Vol. 130, No. 10, October 2004, pp. 1487-1496.
- S. Syngellakis. (2013). *Retrofitting of Heritage Structures: Design and evaluation of strengthening techniques*. UK:WIT Press.

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L	T	P	C
2	-	1.5	3

Course Code	2ARE60
Course Title	Conservation techniques

Course Learning Outcomes (CLO):

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

- Learn about importance of heritage buildings and its conservation.
- Explore different materials and techniques of conservation.
- Execute projects that needs to be restored or conserved using appropriate techniques.

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction	History and modes of architectural conservation <ul style="list-style-type: none"> • Definition • Importance & need of conservation. • Various aspects of conservation of natural and manmade environment. • Classification of conservation — cultural, historical, urban areas. 	3 hours
II.	Process of Conservation	Listing and documentation, its importance and methods. <ul style="list-style-type: none"> • Measures of conservation i.e. protection, maintenance, restoration, reconstruction. • Adoption and adaptation. • Various methods applied for conservation of architectural buildings with examples. 	13 hours
III.	Structural Conservation	Case study discussion and illustrations using various examples <ul style="list-style-type: none"> • Various methods adopted for conservation of heritage structures in India and Abroad. • Theories of identification and conservation of heritage structures. 	7.5 hours
IV.	Conservation	<ul style="list-style-type: none"> • Understanding of conservation processes 	16 hours



	processes and Current Treatments	and its practical use and assessment and treatments of it. <ul style="list-style-type: none"> • Different types of treatments for conservation and its importance of it 	
V.	Conservation management	Methodologies to be adopted for conservation management. <ul style="list-style-type: none"> • Case studies in conservation related to adoptive reuse, building in context, preservation, urban conservation. 	8 hours
VI.	Conservation Legislations	<ul style="list-style-type: none"> • Study of various charters, Acts relation to conservation of heritage structures. • Role of INTACH, UNESCO, ICOMOS, ASI, and other organizations. • Various methods/legislations adopted for encouraging conservation. 	5 hours

Suggested Readings:

- "Introduction: Choosing an appropriate treatment". Secretary of Interior's Standards for the Treatment of Historic Properties. U.S. National Park Service. Retrieved April 5, 2011.
- "Art conservation and restoration". Encyclopædia Britannica Online. Retrieved 29 April 2010.
- Rebano-Edwards, Susan. "Conservation of Stone Buildings - Simple Preservation Techniques for Ancient Buildings." Suite101.com. 20 January 2010.

NIRMA University
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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE61
Course Title	Site & Project Management

Course Learning Outcomes (CLO):

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

- Understand roles & responsibility of site manager
- Learn about the methods of project monitoring and controlling
- Deploy methodology on construction site and implement it in practice

Syllabus: 15 weeks (3.5 hours/week)

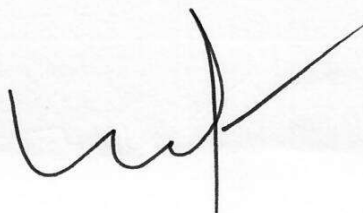
Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Concept of Site Management	History, Background, Scope & Limitation	7 Hours
II.	Project Monitoring & Control	Timescale, Budget, quality control, health & safety check, client-consultant communication, risk-factor	21 Hours
III.	Case studies	Site management models around the world, Local case-studies	24.5 Hours

Suggested Readings:

- McCarthy, J. F. (2010). Construction project management: a managerial approach. Westchester, IL: Pareto -- Building Improvement.
- Andersson, C. (1996). Site management. Geneva: International Labour Office.
- Holroyd, T. M. (1999). Site management for engineers. London: T. Telford. Jha, K. N. (2011). Construction project management

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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE62
Course Title	Mass media studies

Course Learning Outcomes (CLO):

- Students will become aware and understand five principal mass media - Film, TV, Print, Radio and Internet.
- Students will understand how the content of mass media shapes our thoughts, vision, ethics and action.
- Students will understand creativity and process behind Advertising, filmmaking, television production, newsprint, radio and the internet.

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction mass media	<ul style="list-style-type: none"> • Brief history of mass media • Impact of mass media on society at large 	9 Hours
II.	Understanding what is fiction / non fiction	<ul style="list-style-type: none"> • What is Fiction / What is nonfiction • Story as a content – subject, plot, soace, character etc. • Types of stories – news, article, feature, interview, myth, legend, short stories etc. 	15.5 Hours
III.	Role of Advertising	<ul style="list-style-type: none"> • Principles of advertising and its impact on the the society 	14 Hours
IV.	Process of idea to product	<ul style="list-style-type: none"> • Films and television: Pre shooting stage / Shooting stage / Post shooting stage • Processes like writing, Editing, Designing, recording, planning etc. 	14 Hours

Suggested Readings:

- Ang, I. (1996). Living Room Wars: Rethinking Media Audiences for a Postmodern World. London & New York: Routledge.
- Ewen, S. & Ewen, E. (1992). Channels of Desire: Mass Images and the Shaping of American Consciousness. Minneapolis: University of Minnesota Press.
- Gokulsing, K. M. & Dissanayake, W. (1998). Indian Popular Cinema: A Narrative of Cultural Change. London: Trentham Books.

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- Parks, L. & Kumar, S. (eds). (2003). Planet TV: A Global Television Reader. New York & London: New York University Press.
- Askew, K. & Wilk, R. (ed). (2002). The Anthropology of Media: A Reader. Oxford: Blackwell Publishers.

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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE63
Course Title	Alternative construction techniques

Course Learning Outcomes (CLO):

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

- Learn about various aspects of alternative construction techniques.
- Apply the knowledge of construction techniques in building design.
- Design prototypes of buildings using non-conventional building methods and compare with conventional methods.

Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Overview	<ul style="list-style-type: none"> • Importance of Alternative construction technique • Pros and cons of Alternative construction technique 	3 hours
II.	Approaches to different techniques	<ul style="list-style-type: none"> • Techniques • Material • Processes Case study and presentation to explain the same	6 hours
III.	Alternative technique of load bearing construction	<ul style="list-style-type: none"> • Different material i.e. Brick, Stone, Mud and its construction techniques Case study and presentation to explain the same	12 hours
IV.	Alternative technique of frame construction	<ul style="list-style-type: none"> • Study of different Alternative technique of frame construction i.e. light steel frame construction, long span construction, etc. Case study and presentation to explain the same	8 hours
V.	Alternative technique of composite construction	<ul style="list-style-type: none"> • Study of different Alternative technique of combination of load bearing & frame construction i.e. Vernacular buildings Case study and presentation to explain the same	13 hours
VI.	Non-conventional	<ul style="list-style-type: none"> • Study of non-conventional material as building material 	7.5 hours



	material	Case study and presentation to explain the same	
VII.	Comparing conventional and alternative construction techniques	<ul style="list-style-type: none"> • Cost compression • Durability • Maintenance • Easy of construction 	3 hours

Suggested Readings:

- Elizabeth Lynne and Adams Cassandra. (2000). *Alternative Construction Systems: Contemporary Natural Building Methods*. New York, NY: John Wiley & Sons.
- Johan van Lengen. (2008). *The Barefoot Architect: A Handbook for Green Building*. Bolinas, CA, 94924 USA: Shelter Publications.
- Levy Matthys and Salvadori Mario. (2002). *Why Buildings Fall Down: How Structures Fail*. New York: W.W. Norton

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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE64
Course Title	Reuse of building materials

Course Learning Outcomes (CLO):

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

- Apprise waste material as resource for building construction
- Understand methods of reuse of materials
- Design and construct using recycled building materials

Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction	<ul style="list-style-type: none"> • Meaning of reduce, reuse & recycle • Importance of reuse of material 	8.5 hours
II.	Waste Prevention	<ul style="list-style-type: none"> • Concept of waste prevention • Resource Efficiency & Resource Efficient BuildingMaterials Case study and presentation to explain the same	8.5 hours
III.	Construction and Demolition Recycling	<ul style="list-style-type: none"> • Construction and Demolition Materials Recovery & Debris Analysis • Recycling Economics • Architectural Reuse i.e. Architectural Reuse, Design for Reuse Case study and presentation to explain the same	9.5 hours
IV.	Design from used materials	<ul style="list-style-type: none"> • Prepare design drawings & models from used materials • Large scaled model of design • Prepare installation 	26 hours

Suggested Readings:

- Wann David. (1996). *Deep Design: Pathways to a Livable Future*. Washington: Island Press.
- Sim Van der Ryn and Stuart Cowen. (1996). *Ecological Design*. Washington: Island Press

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L	T	P	C
2	-	1.5	3

Course Code	2ARE65
Course Title	Barrier free design

Course Learning Outcomes (CLO):

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

- Understand concept of barrier free design in social contentext
- Explore Various alternatives of barrier free design
- Integrate barrier elements in design of buildings

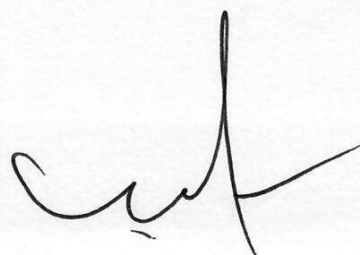
Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Principles	Introduction of Barrier free design and its basic principles.	6 hours
II.	Importance of Barrier free concept	Barrier free concept and ways of implementation of it. Different examples to make a building barrier free	8.5 hours
III.	Standards, Learning from Case studies	Design standards of Barrier free designs Finding out the issues in the buildings, which are not designed as barrier free through case studies.	9 hours
IV.	Design Proposal	Design development to integrate the barrier free elements through, case studies Design for all, its understanding, as per the nation building code and examples to execute such design	29 hours

Suggested Readings:

- Rhoads, M. A. (2010). The ADA companion guide: understanding the Americans With Disabilities Act Accessibility Guidelines (ADAAG) and the Architectural Barriers Act (ABA). Hoboken, NJ: John Wiley.
- 2015 International Building Code 1st Edition by International Code Council (Author)



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L	T	P	C
2	-	1.5	3

Course Code	2ARE66
Course Title	Advanced Computer Application in Design-I

Course Learning Outcomes (CLO):

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

- Understand domain & scope of Computer Aided Design
- Applications of digital fabrication in architecture design
- Generate digital model of buildings & convert it to actual physical model

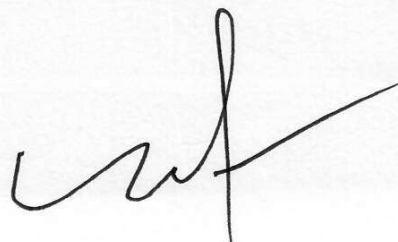
Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction	Overview of advanced computer application	10 Hours
II.	Application of CAD software in design development	Domain & scope of Computer Aided Design, Design Scripts - Python, grasshopper, rhino etc.	20 Hours
III.	Digital model to physical model	Digital Fabrication, 3d printing, laser cut, assembling of pieces etc.	22.5 Hours

Suggested Readings:

- Braumann, J., Brell-Cokcan, S., Willette, A., McGee, W., & León, M. P. (2014). Robotic fabrication in architecture, art and design 2014. Berlin: Springer.
- Adriaenssens, S. (2016). Advances in architectural geometry 2016. Zürich: Vdf Hochschulverlag AG an der ETH Zürich.
- Beorkrem, C. (2013). Material strategies in digital fabrication. New York: Routledge Taylor & Francis Group.
- Gramazio, F., Kohler, M., Picon, A., Roche, F., & Verebes, T. (2014). Made by robots: challenging architecture at a larger scale. London: John Wiley & Sons.
- Gramazio, F., & Kohler, M. (2014). Fabricate: Negotiating Design and Making. Zürich: Gta Verlag / Eth Zürich.
- Naboni, R., & Paoletti, I. (2015). Advanced customization in architectural design and construction. Cham: Springer.
- Pell, B. (2010). The articulate surface: ornament and technology in contemporary architecture. Basel: Birkhäuser.



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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE67
Course Title	Introduction to GIS

Course Learning Outcomes (CLO):

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

- Understand basics of GIS
- Learn about of GIS as an advanced socio-economic planning and management tool
- Application of GIS in the spatial analysis and design process

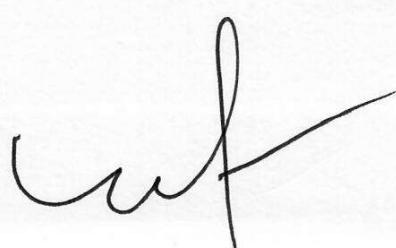
Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Introduction TO GIS	Concept of GIS, Definition, History, Components of GIS, Advantages of GIS	8.5 hours
II.	Fundamentals of GIS	Function of GIS, Basic database: visual and numerical, software applications for GIS: ArcGIS & ArcView	19 hours
III.	GIS applications in planning and design	Tools and techniques for analysis in GIS, presentation. Socio-economic and demographic analysis, Settlement planning: regional and urban planning. Natural resource management, other management applications	25 hours

Suggested Readings:

- Davis, B. E. (2001). GIS: a visual approach. Albany, NY: Delmar Thomson Learning.



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- Grønderud, K. (2009). GIS: the geographic language of our age. Trondheim: Tapir Academic Press
- Hanna, K. C., & Culpepper, R. B. (1998). GIS and site design: new tools for design professionals. New York: Wiley.
- Korte, G. (2001). The GIS book. Australia: Onword Press.

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L	T	P	C
2	-	1.5	3

Course Code	2ARE68
Course Title	Design with Ferro-cement

Course Learning Outcomes (CLO):

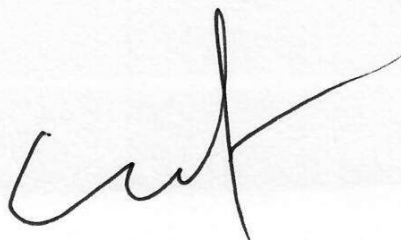
At the end of the course, students will be able to –

- Explore behavior and structural property of ferro-cement
- Learn about the ferro-cement structures from concept to actual construction
- Apply knowledge to design the ferro-cement structures

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5 Hrs.

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Process of building structure	Structure and Structure form What is Structure and its importance in Architecture? Structural form - solid, Surface, skeleton, Membrane, hybrid Structural form - in Nature Structural form - man made Structural material strength, stiffness, shape	14.5 hours
II.	Broad categorization of structural system	Structure types Membrane - Cable/membrane surface, cable nets, pneumatics Hybrids - Tension-assisted structures	9.5 hours
III.	States of stresses	Vertical, Horizontal, Rational settlement and earthquake behavior	9.5 hours
IV.	Basic requirements of structure	Structural Element behavior Tensile, compressive, shear, torsion, bending Model testing and discussion discussion on why it fails?	9.5 hours
V.	Types of loads & supports	Load on Structure Permanent – Temporary dead load, imposed load, thermal load, Dynamic load	9.5 hours



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Suggested Readings:

- Gargiani, R., & Bologna, A. (2016). The rhetoric of Pier Luigi Nervi. Forms in reinforced concrete and ferro-cement. Andover: Routledge Ltd.
- Ferro-cement: illustrated construction manual. (1971). Long Beach, CA: Romack Marine.
- Nervi, P. L. (1956). Ferro-cement: it's characteristics and potentialities. London: Cement and Concrete Association.
- Yates, C. (1970). Ferro cement. Sydney.
- Sandaker, Bjorn N. (2011) Structural Basis of Architecture, UK, Taylor & Francis
- Charleson, Andrew.. (2015) Structure as architecture : Source book for architects and structural engineers. London, Taylor & Francis
- Schodek, Daniel L., (2014) Structures. New Delhi, PHI Learning Private Limited
- Seward, Derek, (2014) Understanding structures: analysis materials design, London, Palgrave
- Levy, Matthys, (2002) Why Buildings Fall Down: How Structures Fail, New York, W. W. Norton and Co.
- Salvadori, Mario. Structure in Architecture. Englewood Cliffs, NJ: Prentice-Hall. (1963)
- Deplazes, and Söffker. (2013) Constructing Architecture: Materials, Processes, Structures. Basel: Birkhäuser Verlag
- Hunt, Tony, (2003) Tony Hunt's Structures Notebook, Oxford: Architectural
- Muttoni, A. (2011) The Art of Structures: Introduction to the Functioning of Structures in Architecture. Abingdon, Oxford, UK: EPFL, Routledge
- Salvadori, Mario, Saralinda Hooker, and Christopher Ragus. (1980) Why Buildings Stand Up: The Strength of Architecture. New York: Norton
- Gordon, J. E. (1984) The New Science of Strong Materials. Or, Why You Don't Fall through the Floor, Princeton, NJ: Princeton UP

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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE69
Course Title	Lightweight Structures

Course Learning Outcomes (CLO):

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

- Understand behavior of material and structural property in lightweight structure
- Learn about lightweight structure from concept to actual construction process
- Apply knowledge to design and build lightweight structures

Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours
I.	Process of building structure	Structure and Structure form What is Structure and its importance in Architecture? Structural form - solid, Surface, skeleton, Membrane, hybrid Structural form - in Nature Structural form - man made Structural material strength, stiffness, shape	14.5 hours
II.	Broad categorization of structural system	Structure types Membrane - Cable/membrane tents, cable nets, pneumatics Hybrids - Tension-assisted structures	9.5 hours
III.	States of stresses	Vertical, Horizontal, Rational settlement and earthquake behavior	9.5 hours
IV.	Basic requirements of structure	Structural Elements Strut, tie, beam, slab/plate, panel Structural Element behavior Tensile, compressive, shear, torsion, bending Model testing and discussion Discussion on why it fails?	9.5 hours
V.	Types of loads &	Load on Structure	9.5 hours

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	supports	Permanent – Temporary Dead load, Imposed load, Thermal load, Dynamic load	
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Suggested Readings:

- James Ambrose. (2012) Building Structure. Canada Wiley
- Millias. Malcolm. (2005) Building structures from concept to design. London. Spon Press
- Biggs. John M., (2014) Introduction to Structural Dynamics. New Delhi. McGraw Hill Education India Pvt Ltd
- Onouye. Barry S., (2015) Statics And Strength Of Materials For Architecture And Building Construction. Chennai. Pearson India Education Services Pvt Ltd.
- Sandaker. Bjorn N. (2011) Structural Basis of Architecture. UK. Taylor & Francis
- Charleson. Andrew., (2015) Structure as architecture : Source book for architects and structural engineers. London. Taylor & Francis
- Schodek. Daniel L., (2014) Structures. New Delhi. PHI Learning Private Limited
- Levy. Matthys. (2002) Why Buildings Fall Down: How Structures Fail. New York. W. W. Norton and Co.
- Salvadori, Mario. Structure in Architecture. Englewood Cliffs, NJ: Prentice-Hall. (1963)
- Deplazes, and Söffker. (2013) Constructing Architecture: Materials, Processes, Structures. Basel: Birkhäuser Verlag
- Hunt. Tony. (2003) Tony Hunt's Structures Notebook. Oxford: Architectural
- Muttoni. A. (2011) The Art of Structures: Introduction to the Functioning of Structures in Architecture. Abingdon, Oxford, UK: EPFL/Routledge
- Salvadori, Mario, Saralinda Hooker, and Christopher Ragus. (1980) Why Buildings Stand Up: The Strength of Architecture. New York: Norton

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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE70
Course Title	Advanced Computer Application in Design – II (Digital Fabrication)

Course Learning Outcomes (CLO):

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

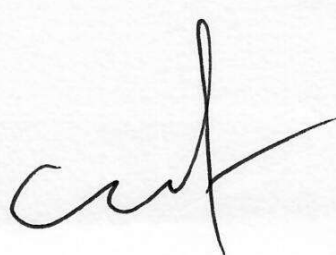
- Understand the domain and scope of Computer Aided Design.
- Explore the software to design parametric forms and evaluate and analyze the form on various parameters.
- Generate physical models of the designed form using digital fabrication process

Syllabus: 15 weeks (3.5 hours/week)
Hrs.

Total Teaching hours: 52.5

Unit No.	Syllabus: Topic	Sub Topic	Teaching hours:
I.	Application of CAD software in design development	Exploring grasshopper as a tool to generate parametric forms and evaluate it using environmental analysis plugins. Plugins to be explored : Octopus Kangaroo Parakeet Weaverbird Pufferfish Anemone Ladybug Rabbit CFD analysis Rhino Vault	30 hours
II.	Physical models using digital fabrication	Constructing a physical model of the parametrically design form using digital fabrication process of Laser cutting, 3d printing or CNC cutting	22.5 hours

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Suggested Readings:

- Braumann, J., Brell-Cokcan, S., Willette, A., McGee, W., & León, M. P. (2014). *Robotic fabrication in architecture, art and design 2014*. Berlin: Springer.
- Adriaenssens, S. (2016). *Advances in architectural geometry 2016*. Zürich: Vdf Hochschulverlag AG an der ETH Zürich.
- Beorkrem, C. (2013). *Material strategies in digital fabrication*. New York: Routledge, Taylor & Francis Group.
- Gramazio, F., Kohler, M., Picon, A., Roche, F., & Verebes, T. (2014). *Made by robots: challenging architecture at a larger scale*. London: John Wiley & Sons.
- Gramazio, F., & Kohler, M. (2014). *Fabricate: Negotiating Design and Making*. Zürich: Gta Verlag Eth Zürich.
- Naboni, R., & Paoletti, I. (2015). *Advanced customization in architectural design and construction*. Cham: Springer.
- Pell, B. (2010). *The articulate surface: ornament and technology in contemporary architecture*. Basel: Birkhäuser.

NIRMA University
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Institute Elective Annexure-I

L	T	P	C
2	-	1.5	3

Course Code	2ARE71
Course Title	Introduction to Infrastructure Planning

Course Learning Outcomes (CLO):

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

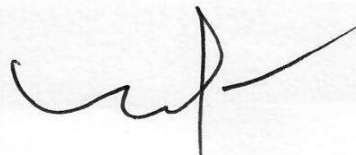
- Understand the basic concepts related to lifeline infrastructure and their significance to human settlements, environment, public health and hygiene
- Inculcate knowledge about storm water drainage system, water supply system, waste water drainage system, solid waste management and other services
- Apply the standards and relate to the concept of demand, supply, and management

Syllabus: 15 weeks (3.5 hours/week)

Total Teaching hours: 52.5Hr

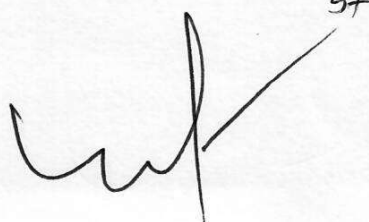
Unit No.	Syllabus: Topic	Sub Topic	Teaching hours: (Weeks)
I.	Introduction to Basic Concepts	Role of the planner in planning of utilities and services Implications of utilities and services planning on public health and environmental protection Familiarizing with different manuals, codes and standards	7 hours
II.	Water Supply Systems	Water and health Surface and ground water sources, quality and quantity, location of sources and water intakes, area requirements of the components of water intakes Water requirement for different land uses, factors affecting water demand, per capita requirement and variations Water treatment system, location and space requirements Components of water distribution systems, Planning for Various uses, Storage and supply network Policy for urban and rural water supply	7 hours
III.	Storm Water Drainage System	Definition of Hydrology Classification, hydrological cycle, urban water cycle Types precipitation and measurement, rain fall	7 hours

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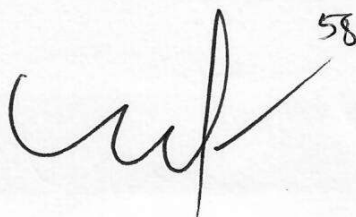
		analysis, surface water runoff, measurements of runoff, watershed Flood frequencies, and flood protection measures in urban areas, layout and design of storm water system, rain water harvesting systems	
IV.	Sanitation and Sewerage Systems	Sanitation and public health Off-site and on-site sanitation and technology Low cost appropriate technologies for sanitation Disposal systems: Conventional and Alternate Standards for Indian cities: Sanitary sewer system network and layout planning, Sewage disposal methods, location criteria and capacity Financing and cost recovery for sewer system Social stigma associated with sanitation: use and disposal Public toilets National urban Sanitation Policy (City Sanitation Plans)	7 hours
V.	Solid Waste Management	Solid waste management for Indian cities, quantity of solid waste and its character Methods of solid waste management, collection, transportation and disposal Land filling and composting, and other methods of pre and post treatment, location and cost aspects of different methods of solid waste disposal systems Community participation and involvement of NGOs in efficient solid waste management	7 hours
VI.	Other Services	Telecommunication Services- Locational criteria for mobile phone towers Gas and oil pipelines Electric substations requirements, capacity, location and space requirement	7 hours
VII.	Service Delivery and Management	Organizations- jurisdictions and financing PPP arrangements and government's role Distribution, companies and regulatory processes Case study on good practice, innovative methods for technology, service delivery, financing and regulation in all the above cases	10.5 hours

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Suggested Readings:

- CPHEEO (2013) "Manual on Sewerage and Sewage Treatment" to be retrieved from <http://cpheeo.nic.in/Sewerage.aspx>
- Garg, S K (2010) "Water Supply Engineering" Khanna Publishers
- IDFC-Government of India (2011) "India Infrastructure Report: Water: Policy and Performance for Sustainable Development" to be retrieved from <https://www.idfc.com/pdf/report/IIR-2011.pdf>
- IDFC-Government of India (2007) "India Infrastructure Report: Rural Infrastructure" to be retrieved from <https://www.idfc.com/pdf/report/IIR-2007.pdf>
- IDFC-Government of India (2006) "India Infrastructure Report: Urban Infrastructure" to be retrieved from <https://www.idfc.com/pdf/report/IIR-2006.pdf>
- Morgan, Charles S (2010) "Regulation and the Management of Public Utilities" UK: Gale
- Peavy, Howard S., Rowe, Donald R. & Tchobanoglous, George (2013) "Environmental Engineering" Tata McGraw Hill
- Town and Country Planning Organisation (2015) "Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines" Ministry of Urban Development, Government of India; to be retrieved from <http://moud.gov.in/upload/uploadfiles/files/URDPFI%20Guidelines%20Vol%20I.pdf>
- Kundu, Amitabh (1991) "Micro Environment in Urban Planning-Access of Poor to Water Supply and Sanitation" EPW, September, 14
- Mohan, Rakesh (2003) "Infrastructure Development in India: Emerging Challenges" Paper presented at Annual Bank Conference on Development Economics, Bangalore
- Shreyaskar, Pankaj K P (2016) "Drawing on the Right to Live with Human Dignity: Contours of Access to Water and Sanitation in India" EPW, December.

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