

NIRMA UNIVERSITY

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

<p>INSTITUTE OF ARCHITECTURE and PLANNING NIRMA UNIVERSITY <u>TEACHING AND EXAMINATION SCHEME FOR SEMESTER V - B.ARCH.</u> <u>(2021 onwards)</u> Name of the Programme: Bachelor of Architecture <u>SEMESTER V</u></p>									
Course Code	Name of the Course	Teaching Scheme				Hours	Scheme of Examination		
		Hours/Week			Credit		SEE	Component Weightage	
		L	W	S		C		SEE	CE
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
<p>#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.</p>									
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\$				
<p>\$ Credit of RSP will be given to those students who registers for RSP in the respective semester</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:	2AR561		
Course Title:	Architectural Design Studio - V		
Course Type:	<input type="checkbox"/> Core	<input type="checkbox"/> Institute Elective	
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/> University Elective	
	<input type="checkbox"/> Departmental Elective	<input type="checkbox"/> Any other	
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. • Resolution of appropriate systems • Explanation of structure system • logical reasoning and practical solution for the proposed built form. 	72 hours
Unit-IV	Design Resolution with Synthesis of design parameters - <ul style="list-style-type: none"> • Site Development-Landscape 	36 hours

- 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:	<ol style="list-style-type: none"> 1) Ching, F. D. K. (2007). <i>Architecture--form, space, and order</i>. 2) Neufert, E., Neufert, P., & Kister, J. (2012). <i>Neufert</i>. Oxford: Wiley-Blackwell. 3) Tilley, A. R., & Henry Dreyfuss Associates. (2002). <i>The measure of man and woman: Human factors in design</i>. New York: Wiley. 4) Alexander, C., Alexander, C., & Alexander, C. (1980). <i>The timeless way of building</i>. New York: Oxford University Press. 5) Alexander, C., Ishikawa, S., & Silverstein, M. (2010). <i>A pattern language: Towns, buildings, construction</i>. New York: Oxford Univ. Pr. 6) Lassus, B. (1998). <i>The landscape approach</i>. Philadelphia: University of Pennsylvania Press. 7) Tuan, Y. (2011). <i>Space and place: The perspective of experience</i>. Minneapolis, MN: University of Minnesota Press. 8) Venturi, R. (1977). <i>Complexity and contradiction in architecture: Robert Venturi</i>. Place of publication not identified: Architectural Press/Museum of Modern Art. 9) Zeisel, J. (1981). <i>Inquiry by design: Tools for environment-behavior research</i>. Cambridge: Cambridge University Press. 10) Booth, N. K. (1990). <i>Basic elements of landscape architectural design</i>. Prospect Heights, IL: Waveland. 11) Eckbo, G. (2009). <i>Landscape for living</i>. Amherst, MA: University of Massachusetts Press. 12) HALPRIN, L. (1976). <i>The RSVP cycles creative processes in the human environment</i>. New York, NY: Braziller. 13) Laurie, M. (1986). <i>An introduction to landscape architecture</i>. New York: Elsevier. 14) Lynch, K. (2012). <i>Site planning</i>. Whitefish, MT: Literary Licensing. 15) Simonds, J. O. (1968). <i>Landscape architecture: The shaping of mans natural environment</i>. New York: Dodge.

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Institute:	Institute of Architecture and Planning											
Name of Programme:	Bachelor of Architecture											
Course Code:	2AR562											
Course Title:	History and Theory-V											
Course Type:	<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;"><input type="checkbox"/> Core</td> <td style="width: 33%;"><input type="checkbox"/> Institute Elective</td> <td style="width: 33%;"></td> </tr> <tr> <td><input type="checkbox"/> Value Added Course</td> <td><input type="checkbox"/> University Elective</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Departmental Elective</td> <td><input type="checkbox"/> Any other</td> <td></td> </tr> </table>	<input type="checkbox"/> Core	<input type="checkbox"/> Institute Elective		<input type="checkbox"/> Value Added Course	<input type="checkbox"/> University Elective		<input type="checkbox"/> Departmental Elective	<input type="checkbox"/> Any other			
<input type="checkbox"/> Core	<input type="checkbox"/> Institute Elective											
<input type="checkbox"/> Value Added Course	<input type="checkbox"/> University Elective											
<input type="checkbox"/> Departmental Elective	<input type="checkbox"/> Any other											
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 Gaudi, Henri Labrouste, etc 	6 hours
Unit-II	Modern Movement in Architecture – <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. 	18 hours

- 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.
- Unit-III Colonial Architecture - 6 hours
- 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-Sarcenic.
 - 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

Self Study:	
Suggested List of Experiments:	
Suggested Case List:	
Suggested Readings/References:	<ol style="list-style-type: none"> 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:	<input checked="" type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
	<input type="checkbox"/> Departmental Elective	<input type="checkbox"/>	Any other
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:	<ul style="list-style-type: none"> • 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:	<input type="checkbox"/> Core	<input type="checkbox"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
	<input type="checkbox"/> Departmental Elective	<input type="checkbox"/>	Any other
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	Understanding the Site, Role of Vegetation & Planting Design Considerations - Macro & Micro Conditions – <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). • Plant Material & Climate: Traditional know how of plants / Native landscape, Organic Gardening. • Identification of Plant Material 	10 hours
Unit-II	Landscape and Planting Design – <ul style="list-style-type: none"> • Definitions of Landscape terminologies 	8 hours

- 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).
- Unit-III Understanding of Hard and Soft Landscape – 8 hours
- Hard Landscape: pathways, water bodies, Benches, Gazebbos, Pergola, etc.
 - Plants and Indoor Air quality.
 - Process of Planting and Transplanting of Trees.
- Unit-IV Landscape Design & Site Planning Opportunity – 4 hours
- Zones / green belt, regional park, city park, district park, community park, multipurpose open space.
 - Design (Bones, colour, focal points, textures, sound).

Self Study:	
Suggested List of Experiments:	
Suggested Case List:	
Suggested Readings/References:	<ol style="list-style-type: none"> 1. Laurie, M. (1983). <i>Introducción a la arquitectura del paisaje/An introduction to landscape architecture</i> (No. 712). Gustavo Gili,. 2. Lynch, K. (1960). <i>The image of the city</i> (Vol. 11). MIT press. 3. Lynch, K., Lynch, K. R., & Hack, G. (1984). <i>Site planning</i>. MIT press. 4. Alexander, C. (1979). <i>The timeless way of building</i> (Vol. 1). New York: Oxford University Press. 5. Cooper, G., & Taylor, G. (2000). <i>Gardens for the Future: Gestures against the Wild</i>. Conran Octopus. 6. Groth, P., Groth, P. E., & Bressi, T. W. (Eds.). (1997). <i>Understanding ordinary landscapes</i>. Yale University Press. 7. Bose, T. K., Chowdhury, B., & Sharma, S. P. (2008). <i>Shrubs, Tropical garden Plants in Colour</i>. 8. Amoroso, N. (2019). <i>Representing Landscapes: Analogue</i>. Routledge. 9. Beer, A. R. (1987). <i>An introduction to landscape architecture: by Michael Laurie</i>. 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). <i>Landscape architecture: A manual of environmental planning and design</i>. New York: McGraw-Hill Education. 11. Zaitzevsky, C. (1982). <i>Frederick Law Olmsted and the Boston</i>

	<i>park system</i> (p. 96). Boston, MA: Belknap Press.
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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:	<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;">Core</td> <td style="width: 33%;">Institute Elective</td> </tr> <tr> <td></td> <td>Value Added Course</td> <td>University Elective</td> </tr> <tr> <td></td> <td>Departmental Elective</td> <td>Any other</td> </tr> </table>		Core	Institute Elective		Value Added Course	University Elective		Departmental Elective	Any other		
	Core	Institute Elective										
	Value Added Course	University Elective										
	Departmental Elective	Any other										
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 – <ul style="list-style-type: none"> • Study of fire fighting regulations, fire alarming & extinguishing system, fire hydrants-their types, location, 	6 hours

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:	<ol style="list-style-type: none"> 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"/>	Institute Elective
	<input type="checkbox"/> Value Added Course	<input type="checkbox"/>	University Elective
	<input type="checkbox"/> Departmental Elective	<input type="checkbox"/>	Any other
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:	<ol style="list-style-type: none"> 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.

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Institute:	Institute of Architecture and Planning											
Name of Programme:	Bachelor of Architecture											
Course Code:	2AR567											
Course Title:	Related Study Programme (RSP)-IV											
Course Type:	<table border="1" style="width: 100%;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;">Core</td> <td style="width: 33%;">Institute Elective</td> </tr> <tr> <td></td> <td>Value Added Course</td> <td>University Elective</td> </tr> <tr> <td></td> <td>Departmental Elective</td> <td>Any other</td> </tr> </table>		Core	Institute Elective		Value Added Course	University Elective		Departmental Elective	Any other		
	Core	Institute Elective										
	Value Added Course	University Elective										
	Departmental Elective	Any other										
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

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 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
	Departmental Elective		Any other
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 <ul style="list-style-type: none"> • Design Environment 	3 hours

	<ul style="list-style-type: none"> • 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
	Departmental Elective		Any other
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	Tools and Raw Materials <ul style="list-style-type: none"> • The tools and raw materials used • Wooden board/ Hardboard 	3 hours

	<ul style="list-style-type: none"> • Clay,Glue,Chalk Powder,Sawdust, • Scale,Pencil,Frame,Color,Mirror,Waste Cloth 	
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:	<input type="checkbox"/>	Core	<input checked="" type="checkbox"/> Institute Elective
	<input type="checkbox"/>	Value Added Course	<input type="checkbox"/> University Elective
	<input type="checkbox"/>	Departmental Elective	<input type="checkbox"/> Any other
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	Sanitary Wares <ul style="list-style-type: none"> • Types of sanitary wares, earthenwares and stoneware 	6 hours

	<p>sanitary wares, Details of fire clay sanitary wares and vitreous sanitary wares.</p> <ul style="list-style-type: none"> Raw materials used for manufacture of fire claysanitary wares, earthenware and vitreous sanitary wares. 	
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:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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

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:	2AREA06		
Course Title:	Graphic Signage		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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

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:	2AREA11		
Course Title:	Color in Architecture		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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 <ul style="list-style-type: none"> • Behavior and effects of colour composition • Impression of colour and how it supports the function of a space 	7 hours

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	
	Departmental Elective	Any other	
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 <ul style="list-style-type: none"> • Learning to read of graphs and Simulation 	6 hours
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 Edition 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
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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-IV	Stage/set design <ul style="list-style-type: none"> • Practically create a stage / part of the stage/set as a group work 	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:	2AREA15		
Course Title:	Art Appreciation		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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	<p>Art Making</p> <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	<p>Art History Early Civilizations</p> <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	<p>Early Christian to Gothic</p> <ul style="list-style-type: none"> • Artworks and architecture from the Early Christian Era, Byzantine Era, and from Islamic cultures 	3 hours
Unit-VII	<p>Renaissance to Rococo</p> <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	<p>Early Modernism</p> <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	<p>Modernism</p> <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	<p>Exploring World Art</p> <p>Artworks from Africa and Asia, including wall paintings, power figures, relic guards, and masks</p> <p>Asian artworks, including Buddhist and Hindu art such as architecture, sculpture, landscapes, ink paintings, and printmaking</p>	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	
	Departmental Elective	Any other	
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
	Departmental Elective		Any other
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 What is a critic? <ul style="list-style-type: none"> • Approaches to analysis and interpretation 	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:	2AREA18		
Course Title:	Journalism- An introduction		
Course Type:	Core	Institute Elective	
	Value Added Course	University Elective	
	Departmental Elective	Any other	
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 <ul style="list-style-type: none"> • Concept of Journalism, Definition, History 	6 hours
Unit-II	Fundamentals of Journalism <ul style="list-style-type: none"> • Advantages of Journalism, concept of Ethical journalism, Journalism in design field 	12 hours
Unit-III	Role of Journalism in general & in design field <ul style="list-style-type: none"> • Case Studies –Global & Local, Short Project 	12 hours

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

Experiments:

Case List:

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
	Departmental Elective		Any other
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 Lazzaroni.
 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.

Experiments:

Case List:

NIRMA UNIVERSITY

Institute:	Architecture & Planning		
Name of Programme:	Bachelor of Architecture		
Course Code:	2AREA20		
Course Title:	Temporary Structures		
Course Type:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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 Hcny 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:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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 <ul style="list-style-type: none"> • Bio-inspired structure and construction, Minimal surfaces, Architectural interpretation, Geometry and computation • Explore design method and techniques to apply bio-mimetic concepts 	10 hours

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. I*. 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	
	Departmental Elective	Any other	
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 <ul style="list-style-type: none"> • Adding graphics and clip art • Working with graphics 	3 hours
Unit-VII	Proofing, printing, and exporting <ul style="list-style-type: none"> • Spelling and grammar, AutoCorrect • Printing and exporting documents 	6 hours

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
	Departmental Elective		Any other
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 <ul style="list-style-type: none"> • Curtain walling - 3d views - Rendered outputs - Schedules - Families (basic content creation)- Details & Callouts - Linked files - Layouts & Plotting 	7 hours
Unit-V	Conceptual modelling Collaboration & Analysis <ul style="list-style-type: none"> • Organic conceptual modelling - Linking to other modelling software - Collaboration - BIM Analysis 	7 hours

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
	Departmental Elective		Any other
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:	Core		Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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
	Departmental Elective		Any other
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 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 • Exposure to other cultures have greatly influenced the traditions and culture of the different regions 	20 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.
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 building		
Course Type:	Core	■	Institute Elective
	Value Added Course		University Elective
	Departmental Elective		Any other
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 – <ul style="list-style-type: none"> • 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 	10 hours

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
5. 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: