



**COURSE OF STUDY**  
**FOR**  
**Bachelor of Science in Building Design**  
*(Four Years)*



**SCHOOL OF DESIGN AND PLANNING**  
**CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT**  
**BHUBANESWAR CAMPUS**

# Bachelor of Science in Building Design

June 2018

## Course Structure

1 <sup>th</sup> Semester				2 <sup>nd</sup> Semester			
<i>Theory</i>				<i>Theory</i>			
Code	Subject	L-T-P	Credit	Code	Subject	L-T-P	Credit
BBD 1101	Introduction to Building Design	3-0-0	3	BBD 1201	Environment Psychology	3-0-0	3
BBD 1102	English	2-0-3	3	BBD 1202	History of Building Design –I	3-0-0	3
BBD 1103	Building Materials	3-0-0	3	BBD 1203	Mechanics - II	3-0-0	2
BBD 1104	Mechanics - I	3-0-0	3	BBD 1204	Building Material -II	3-0-0	3
<b>Theory Credits 12</b>				<b>Theory Credits 11</b>			
<i>Practical/Sessional</i>				<i>Practical/Sessional</i>			
BBD 1105	Basic Design – I	0-0-6	6	BBD 1204	Basic Design – II	0-0-6	6
BBD 1106	Descriptive Geometry – I	0-0-6	3	BBD 1205	Building Construction – I	0-0-6	3
BBD 1107	Building Design Presentation- I	0-0-3	2	BBD 1206	Descriptive Geometry – II	0-0-6	3
BBD 1108	Workshop - I	0-0-6	2	BBD 1207	Building Design Presentation- II	0-0-3	2
				BBD 1208	Workshop – II Building/Structure Model Making	0-0-3	1
Practical/Sessional Credits			<b>13</b>	Practical/ Sessional Credits			<b>15</b>
<b>TOTAL SEMESTER CREDITS</b>			<b>25</b>	<b>TOTAL SEMESTER CREDITS</b>			<b>26</b>
<b>TOTAL CUMULATIVE CREDITS</b>			<b>25</b>	<b>TOTAL CUMULATIVE CREDITS</b>			<b>51</b>
<b>Total Contact Hours.</b>			<b>35</b>	<b>Total Contact Hours.</b>			<b>33</b>

3rd Semester				4th Semester			
<i>Theory</i>				<i>Theory</i>			
Code	Subject	L-T-P	Credit	Code	Subject	L-T-P	Credit
BBD 2101	Climatology	3-0-0	3	BBD 2201	Interior Design	3-0-0	3
BBD 2102	History of Building Design -II	3-0-0	3	BBD 2202	History of Building Design III	3-0-0	3
BBD 2103	Strength of materials	3-0-0	3	BBD 2203	Acoustics	3-0-0	3
BBD 2104	Surveying & Levelling	3-0-0	2	BBD 2204	Specification and Quantities	3-0-0	3
				BBD 2205	Structural Analysis	3-0-0	3
				BBD 2206	Water Supply And Sanitation	3-0-0	3
<b>Theory Credits 11</b>				<b>Theory Credits 18</b>			
<i>Practical/Sessional</i>				<i>Practical/Sessional</i>			
BBD 2105	Building Design & Planning- I	0-0-6	6	BBD 2207	Building Design and Planning- II	0-0-6	6
BBD 2106	Building Construction - II	0-0-6	3	BBD 2208	Building Construction –III	0-0-6	3
BBD 2107	Descriptive Geometry - III	0-0-6	3	BBD 2209	Computers In Design - II	0-0-3	2
BBD 2108	Computers In Building Design-I	0-0-3	2				
Practical/Sessional Credits			<b>14</b>	Practical/Sessional Credits			<b>11</b>
<b>TOTAL SEMESTER CREDITS</b>			<b>24</b>	<b>TOTAL SEMESTER CREDITS</b>			<b>29</b>
<b>TOTAL CUMULATIVE CREDITS</b>			<b>25</b>	<b>TOTAL CUMULATIVE CREDITS</b>			<b>54</b>
<b>Total Contact Hours.</b>			<b>33</b>	<b>Total Contact Hours.</b>			<b>33</b>

5 <sup>th</sup> Semester				6 <sup>th</sup> Semester			
<i>Theory</i>				<i>Theory</i>			
Code	Subject	L-T-P	Credit	Code	Subject	L-T-P	Credit
BBD 3101	Theory of Design	3-0-0	3	BBD 3201	Contemporary Design	3-0-0	3
BBD 3102	Sociology	3-0-0	3	BBD 3202	Illumination And Elect. Services	3-0-0	3
BBD 3103	Estimating and Costing	3-0-0	3	BBD 3203	Landscape Planning	3-0-0	3
BBD 3104	Design of RCE Structures	3-0-0-	3	BBD 3204	Design of Steel Structures	3-0-0	3
BBD 3105	Seminar	0-0-2	2		ELECTIVE – II (Any One)	3-0-0	3
	ELECTIVE –I (Any One)	3-0-0-	3	BBD 3205	Prefab And Modular Co-ord.		
BBD 3106	Sustainable Planning			BBD 3206	Project Management		
BBD 3107	Disaster Resistant Building Design			BBD 3207	Industrial Planning		
BBD 3108	Photography						
<b>Theory Credits 17</b>				<b>Theory Credits 15</b>			
<i>Practical/Sessional</i>				<i>Practical/Sessional</i>			
BBD 3109	Building Design – III	0-0-9	9	BBD 3208	Building Design – IV	0-0-9	9
BBD 3110	Building Construction - IV	0-0-6	3	BBD 3209	Building Construction – V	0-0-3	2
				BBD 3210	Working Drawing – I	0-0-6	3
Practical/Sessional Credits			<b>12</b>	Practical/ Sessional Credits			<b>14</b>
<b>TOTAL SEMESTER CREDITS</b>			<b>29</b>	<b>TOTAL SEMESTER CREDITS</b>			<b>29</b>
<b>TOTAL CUMULATIVE CREDITS</b>			<b>29</b>	<b>TOTAL CUMULATIVE CREDITS</b>			<b>59</b>
<b>Total Contact Hours.</b>			<b>32</b>	<b>Total Contact Hours.</b>			<b>33</b>

7 <sup>th</sup> Semester				8 <sup>th</sup> Semester			
<i>Theory</i>				<i>Theory</i>			
Code	Subject	L-T-P	Credit	Code	Subject	L-T-P	Credit
BBD 4101	Urban Design	3-0-0	3	BBD 4201	Building Bye- Laws	3-0-0	3
BBD 4102	Housing	3-0-0	3	BBD 4202	Tendering and Tender Documents	3-0-0	3
BBD 4103	Design Conservation	3-0-0	3				
BBD 4104	Air conditioning and Ventilation	3-0-0	3				
	ELECTIVE – III (Any One)	3-0-0	3				
BBD 4105	Barrier Free Environment						
BBD 4106	Building Economics						
BBD 4107	Intelligent Buildings						
<b>Theory Credits 15</b>				<b>Theory Credits 17</b>			
<i>Practical/Sessional</i>				<i>Practical/Sessional</i>			
BBD 4108	Building Design - V	0-0-9	9	BBD 4203	Building Design - VI	0-0-12	12
BBD 4109	Building Construction – VI	0-0-3	2	BBD 4204	Internship/Professional training	0-0-18	12
BBD 4110	Working Drawing - II	0-0-6	3				
Practical/Sessional Credits			<b>14</b>	Practical/ Sessional Credits			<b>12</b>
<b>TOTAL SEMESTER CREDITS</b>			<b>29</b>	<b>TOTAL SEMESTER CREDITS</b>			<b>30</b>
<b>TOTAL CUMULATIVE CREDITS</b>			<b>29</b>	<b>TOTAL CUMULATIVE CREDITS</b>			<b>59</b>
<b>Total Contact Hours.</b>			<b>33</b>	<b>Total Contact Hours.</b>			<b>36</b>

1 Credit of Theory is equivalent to 1 hr of class per week, for 15 weeks.

1 Credit of Practice/Project is equivalent to 2 hr of class per week, for 15 weeks.

1 Credit of Professional Training/Internship is equivalent to 1.5 hr of work per week

Code to be provided by the University

## 1. Objective

B.Sc. in Design and Planning provides knowledge of principles of planning, design elements and understanding of psychology of a space. The students are given exercises which helps them develop creative and innovative thinking, which is the most vital asset for achieving success in the field of design.

Delivery method of the program includes classroom lectures, studio works, design competitions, exhibitions, creative workshops, project reports, market surveys and internships for practical experience of the design world.

This course structure educate students about the technical ways of building functional and comfortable spaces for the ease of all individuals. The student should be 12<sup>th</sup> qualified or equivalent with science and Mathematics as pre-requisite.

## 2. Learning outcome

- The student will become a professional practicing node in the world of construction. He/She will have proper understanding of 3D and 2D Composition with skills of precise size judgement, latest designs and innovations with in depth material knowledge. Technical drawing and drafting would be a major contribution to the subject for projection of ideas, so after graduating from the University, the person can practice, teach, assist in construction offices and go for intense research.*

## 3. Evaluation Systems

<b><i>Internal Examination</i></b>	<b><i>Component</i></b>	<b><i>% of Marks</i></b>	<b><i>Method of Assessment</i></b>
	Midterm Test	30	Written examination
	Assignment	20	Report and Presentation
	Experiments		Lab work, report
	Project	40	Report and presentation
	Quiz	10	Surprise/preannounced ones
<b><i>External Examination</i></b>			Written examination
<b><i>Total</i></b>		100	

#### 4. Course outline and Reference books (including e-publications mentioned)

FIRST SEMESTER	
THEORY	
BBD 1101	<p><b>INTRODUCTION TO BUILDING DESIGN (3-0-0)</b>  <b>Aim:</b> To elaborate on how a person blends his or her vision and dreams with materials to erect milestones which leave a powerful imprint on human mankind.</p> <p><b>Objective:</b> Emphasis to be given on basics of science involved in building design like surveying, plumbing and services.</p> <p><b>Course content:</b>  <i>Module I</i>            Building Design is the study which deals with planning and designing of building and structures. Definition and concept of Design and planning experienced through the ages. Philosophy of Design propagated by some leading legends/architects. Factors influencing building Design such as climate, materials, socio cultural and technological influences.</p> <p><i>Module II</i>            Mandatory professional codes and guidelines to be followed by a building designer. Introduction to some old and new projects in India and abroad. Opportunities to work after completion of their course are: practicing alone, in organizations, as interior designers, as teachers as well as in a team.</p> <p><i>Module III</i>            Some of the government organizations such as Public Works Department, the Archaeological Department, Ministry of Defence, Departments of Railways, Development Authorities, Housing Boards and Local Bodies which are responsible for construction works recruit architects.</p> <p><b>(Orientation and overview only)</b>            Opportunities of Higher studies for students:            Master of City Planning, Master of Science ( with specialization in Urban Design, Urban Planning, Conservation, Transportation, Construction Management, Product Design ,et al)</p> <p>Personality requirement of a student in the field:            One should be a creative artist with an interest and bent of mind towards designing. Ability to sketch, free hand plan though not of utmost importance, is helpful while explaining to the clients the very intricate details of the structure. One needs to have an imaginative and perspective outlook. Awareness of social and environmental factors, observant attitude adds to the advantage while designing. Apart from being technically sound, good mathematical ability is essential as the work involves complex designing problems, building economics and cost estimations. Often architects deal with legal procedures and documents making it necessary for them to have clarity of thought to understand the legal language.</p>

	<p><b>Reference :</b>  <i>James Snider Catmese, Introduction to Design.</i></p>
<b>BBD 1102</b>	<p><b>ENGLISH (2-0-3)</b></p> <p><b>Aim:</b>  The English program offers intensive and extensive instruction to help students improve their ability in reading, writing, understanding and speaking English. The program also aims at providing opportunities to the students, by means of suitable English literary works for the healthy development of their emotional and aesthetic life.</p> <p><b>Objective:</b>  Groom the students with lectures tutorials, labs and assignments in English which will give them adequate powers of comprehension and expression, for meeting not only the needs of ordinary day-to-day situations of life but also the demands of their own professional fields.</p> <p><b>Course Contents:</b>  <i>Module I</i>  Vocabulary, sentence structure, Grammar and usage.  <i>Module II</i>  Comprehension, Composition, Scientific and Technical Report Written, Drafting Notes, Using Reference Books, English sounds, stress Rhythm, Intonation, listening Comprehension, Note-taking.  <i>Module III</i>  Lessons in Spoken English in the Language, Laboratory Classes, Selected Poems, Essays Plays and Short stories with a view to enriching the student's intellectual, emotionally and aesthetic life.</p> <p><b>Reference</b>  <i>Aiyer and Desai, English for technical students, the popular book store, Surat.</i>  <i>E.F.Candling, An English for technical students, University of London Press, London.</i></p>
<b>BBD 1103</b>	<p><b>BUILDING MATERIALS – I (3-0-0)</b></p> <p><b>Aim:</b> General introduction to building materials.  <b>Objective:</b> Study and understand various construction material, their use and application techniques.</p> <p><b>Course content:</b>  <i>Module I-Basic construction materials</i>  <b>Soils:</b> Formation – characteristics, Identification, Local names, Classification, Sources and uses of sand.  <b>Bricks:</b> Types and their qualities and their manufacture.  <b>Lime:</b> Fat and Hydraulic lime, their uses and properties, manufacture of lime, preparation of lime mortar, functions and requirements of good mortar, mix proportions of various works.  <b>Stones:</b> Types and their qualities and their methods of quarrying.  <b>Cement:</b> Type, properties, composition and manufacturing process and setting of cement</p>



	<p>composition of cement mortar. Plastering.</p> <p><i>Module II-Substitute material</i>  <b>Timber:</b> Uses and characteristics of timber, cutting, seasoning, and preservation of timber. Types of Timber and defects in timber. Protection from termites.  <b>Iron and Steel:</b> cast iron, Steel and wrought iron with properties, brief idea of manufacturing process and use of iron work in buildings.</p> <p><i>Module III-Surface treatments</i>  <b>Paints and Varnishes:</b> Composition, manufacture and properties and uses of ordinary paints, Varnishes and wood preservatives, method of distempering wall surfaces, and painting of timber and iron work.  <b>Glass:</b> Types of glass like plate, decorative, tinted, heat absorbing etc. structural glass bricks and glasscrete, fibre glass, wool etc.</p> <p><b>Reference:</b>  S.C. Rangwala, <i>Engineering Materials</i> , Charotar publishing house, Anand, 1982  S.C. Rangwala, <i>Building Construction</i> ,Charotar publishing house, Anand.</p>
<p><b>BBD 1104</b></p>	<p><b>MECHANICS – I (3-0-0)</b></p> <p><b>Aim:</b> To study Basics of Mechanics and their co-relation with Building design  <b>Objective:</b> Simple Structural analysis and its application in designing of a building</p> <p><b>Course content:</b>  <i>Module I</i>  Forces- definitions and review of theories relating to coplanar force systems – Problems relating to coplanar force systems.  <i>Module II</i>  Simple plane frames – analytical methods of analysis of determinate frames only.  <i>Module III</i>  Beams – Simply supported, cantilever and overhanging beams – significance of different types of supports and loads – calculations of reactions.  Shear force and Bending moment - relations between them.  Analytical methods of sketching S.F. and B.M. diagrams.</p> <p><b>Reference:</b></p> <ol style="list-style-type: none"> <li>1. Fundamentals of Engineering Mechanics, 2<sup>nd</sup> Ed. S. Rajashekharan and G. Sankara Subramanian. Publishers: Vikas Publishing House Pvt.Ltd.</li> <li>2. Engineering Mechanics, K.L.Kumar.T.M.H.</li> <li>3. Elements of Strength of Materials. S.Timoshenko and D.H. Young. McGraw Hill.</li> </ol>

	PRACTICAL / SESSIONAL
BBD 1105	<p><b>BASIC DESIGN-I (0-0-6)</b></p> <p><b>Aim:</b> The study aims at building up the vocabulary in basic design principles.  <b>Objective:</b> The program leads the student and develops in him the ability to systematically arrive at “Building Design” solutions.</p> <p><b>Course contents:</b>  Exercises to be introduced with objectives of defining form, colour, volume, texture and its allied properties. Perception: Visual, Audio, Smell, Tactile and Taste. Exercise to recognize these. Understanding its association to Planning and design.</p> <p><i>Module I</i>  Study, analyze and document the shelter of Birds, Animals and Insects.  Transformation/ understanding of point, line, planes, volumes, and forms.</p> <p><i>Module II</i>  To familiarize the student with shape, size, colour, texture, lighting, which are all attributes of form. Exercises on composition in all the above attributes should be carried out.</p> <p><i>Module III</i>  Understanding the various organizing principles such as: Axis, Symmetry, Rhythm, Harmony, Contrast, Balance, Hierarchy, Monotony etc. Followed by exercises based on these principles.</p> <p>Reference Books:  1. V.S.Parmar, <i>Design fundamentals of Building Desing</i>, , Somaiya publications private limited, New Delhi.  2. Francis D.K.Ching, <i>Architecture-Form, space and order</i>, Van, Nostrand Reinhold company, NewYork.</p>
BBD 1106	<p><b>DESCRIPTIVE GEOMETRY – I (0-0-6)</b></p> <p><b>Aim:</b> Uses of instruments in drafting, dimensioning. Plan and proportional scales.  <b>Objective:</b> To understand concepts of advanced geometry and apply in drafting their on imagination on paper with the help of tutorials.</p> <p><b>Course contents:</b>  <i>Module I</i>  Lines and angles, proportional, triangles, quadrilaterals, circles and tangents. Circles touching lines, regular, polygons, arches, plane curves. ellipse, parabola and hyperbola.</p> <p><i>Module II</i>  Concept of Orthographic Projection, First-Angle Projection, Projections of Points, Projections of Straight Lines, Projections of Planes, Projections of Solids, Intersection of Surfaces. Development of Surfaces.</p> <p><i>Module III</i>  Geometry of lines and planes, Geometrical shapes (two dimensional)-polygons volutes. Study of solid geometrical forms in various positions including group of forms. Simple Projections and projections of solids, Polyhedron, solids of revolution, solids in simple position, Axis</p>

	<p>Perpendicular to a plane, Axis parallel to both the planes, Axis parallel to one plane and inclined to other. Axis inclined to both the planes. Spheres.</p> <p>Section of solids-Section planes, True shapes of section, sections-of prisms, sections of pyramids, cylinders, cones etc.</p> <p><b>Reference:</b></p> <ol style="list-style-type: none"> <li>1. <i>Engineering Drawing by N.D. Bhatt &amp; V.M. Panchal, Charotar Publishing House, Anand</i></li> <li>2. <i>N.D.Bhatt, Elementary Engineering drawing, Chartor publishing house.</i></li> <li>3. <i>A.C.Parkinson, London, Sir Issac Pitman and sons. A First year Engg. Drawing.</i></li> <li>4. <i>Earl D.Black. Engg. and Technical Drawing.</i></li> <li>5. <i>S.C.Sharma, Engg.. Drawing, S.Chand&amp; Company, New Delhi.</i></li> </ol>
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<b>BBD 1107</b>	<p><b>BUILDING DESIGN PRESENTATION - I (0-0-3)</b></p> <p><b>Aim:</b> To study the use of colours and rendering techniques to prepare two and three dimensional presentations. The subject also aims to enhance the skills in visual perceptions of design.</p> <p><b>Objective:</b> Understand the meaning of art, various types of arts - fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art, etc., relationship of Building Design with other arts like painting and Sculpture.</p> <p><b>Course content:</b></p> <p><i>Module I</i> Study of colours and colour schemes. Composition with primary, secondary &amp; tertiary colours, Composition with complementary, split and analogous colours.</p> <p><i>Module II</i> Study of light and shade effects on simple objects. Sketching of simple natural / manmade forms in combination with trees, human figures, etc. using pencil.</p> <p><i>Module III</i> Rendering buildings and other manmade forms in combination with natural elements using pen and ink, charcoal, water colours etc. To study and practice through lettering exercises and graphical presentations techniques.</p> <p><b>Reference:</b></p> <p><i>James Richards, Free hand drawing and Discovery.</i> <i>Architectural Graphics, by Francis D.K.Ching.</i></p>
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<b>BBD 1108</b>	<p><b>WORKSHOP - I (0-0-6)</b></p> <p><b>Aim:</b> To equip students with knowledge and hand on practice sessions</p> <p><b>Objective:</b> Involve students in Skill workshop sessions to understand the making of products.</p> <p><b>Course content:</b></p>
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	<p><i>Module I</i> Fitting ( One job ) : Fitting tools like – files, vice, chisels, scriber, hammers, surface plate, try square, callipers,, etc. Fitting operations such as filing, grinding, sawing, marking, drilling, tapping, safety precaution, demonstration of various operations, and preparation of male – female joints.</p> <p><i>Module II</i> Carpentry (two joint job) : Carpentry tools like – saw, planer, chisels, hammers, pallet, marking gauge, vice, tee square, rule, etc., carpentry operations such as marking, sawing, planning, chiselling, grooving, boring, joining, type of woods, and carpentry hardware, safety precaution, demonstration of various operations by using hardware.</p> <p><i>Module III</i> Welding ( one job ) : Electric arc welding, welding machines different types of electrodes, screen fixers, hand gloves, demonstration of welding operation.</p> <p><b>Reference :</b></p> <p>1) <i>Work familiarization</i> : E. Wilkinson 2) <i>Workshop technology</i> : A.K. Hajrachaudhuri &amp; S.K. Hajrachaudhuri 3) <i>ITB Handbook</i> : Engineering Industry Training Board 4) <i>Workshop Technology. Vol. I&amp;II</i> : Gupta &amp;Kaushik</p>
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SECOND SEMESTER	
THEORY	
<b>BBD 1201</b>	<p><b>ENVIRONMENT PSYCHOLOGY (3-0-0)</b></p> <p><b>Aim:</b> The subject is focused on the interplay between humans and their surroundings. The field defines the term environment broadly, encompassing natural environments, and informational environment.</p> <p><b>Objective:</b> Introduction to built environment psychological aspects and natural habitat</p> <p><b>Course content:</b> <i>Module I</i> Human beings are in constant interaction with the environment. With the growth of civilization, men are making more and more artificial environments, and planners play a significant role in this process. Meaning of environment; Measurement of environmental stimuli from psychological aspect. Behavioral effects of Environmental conditions. Physical – Noise, Temperature and air pollution. Social – Overcrowding and isolation. Extra ordinary – Catastrophe.</p>

	<p><i>Module II</i>  <i>Introduction to Geystall's principles.</i>  Perceptual factors of environment – perception of distance. Size and movement. Meaning of colour and form. Social and Cultural influences on environmental perception.  Personal space – individual and situational as determinates of personal space.  Consequences of too much or too little of Personal space. Personal space and environmental space as implications for design aspects.</p> <p><i>Module III</i>  Psychological aesthetics – Measurement of communication through art; determination of pleasantness and unpleasantness as unpleasantness as psychological factors in environmental design. Place identity, place attachment,  Space – over-time orientation.  Adaptation to environment – Behavioral aspects of adaptation to familiar and unfamiliar environment.</p> <p><b>Reference</b>  Oscar Newman, Defensible space.  Wicius Wong, Principles of colour composition  Bell, P.A. Fisher, J.D. Leomis, R.J – Environmental psychology  Munn, N.C. Psychology, Fundamentals of Human adjustment.</p>
<p><b>BBD1202</b></p>	<p><b>History of Building Design – I (3-0-0)</b>  <b>Aim:</b> Explanation of the need to study History of Building Design.  <b>Objective:</b> Study of houses, temples and tombs and appreciation of Indian history.</p> <p><b>Course Content:</b></p> <p><i>Module I</i>  Buddhist Period – Chaitya, Vihara and Stupas, influence of timber construction and forms, rock cut and Buildup.</p> <p><i>Module II</i>  Jain Period – General planning, setting and decorative treatment of temples.  Examples of Dilwara temple groups in mount Abu, Raunakpur temples.</p> <p><i>Module III</i>  Hindu Period – Development of Dravidian, Chalukyan and Indo-Aryan temples,(rock cut and built-up) in India.</p> <p><b>Reference</b>  Banister Fletcher, A History of Architecture. Satish Grover, Architecture in India.  Percy Brown, The History of Indian Architecture.  G. K. Hiraskar. World History of Architecture. Dhanpat Raj and Sons.</p>

<p><b>BBD 1203</b></p>	<p><b>MECHANICS – II (3-0-0)</b></p> <p><b>Aim :</b> To study concepts of Mechanics and their application in building design  <b>Objective:</b> Student should be able to calculate simple stress-strain of beam-column in a building design.</p> <p><b>Course content:</b></p> <p><i>Module I</i>  Principles of virtual work: Equilibrium of Ideal Systems, Efficiency of simple mechanics, of simple mechanics, Stable and unstable equilibrium.  Dynamics-Kinematics: of Curvilinear motion, Motion of Projectile, Moment of Moment, The compound pendulum,</p> <p><i>Module II</i>  Moment of Inertia  Moments of Inertia of Plane Figures with respect to an axis theorem, Product of inertia, Principal axes and Principal moments 1 of inertia.</p> <p><i>Module III</i>  Solid Mechanics  Concepts of Stress &amp; Strain: Normal stress, Sheer stress, normal strain, shear strain, Hooke’s law, Poisson’s ratio, Principal stresses, Principal strains, Mohr’s Circle for stress and strain.</p> <p><b>Reference</b>  Engineering Mechanics by : S. Timoshenko, D.H. Yound, Mc-Graw Hill International Edition Chapters: 1,2,2,3, &amp; 6.  Fundamentals of Engineering Mechanics, Second Edition, Publisher: Vikas Publishing House Pvt. Ltd by S. Rajashekharan and G. Sankara Subramanian.  Engineering Mechanics, K. L. Kumar, TMH  Elements of Strength of Materials by Timoshenko &amp; Young.</p>
<p><b>BBD 1204</b></p>	<p><b>Building Material – II (3-0-0)</b></p> <p><b>Aim :</b> To study derivatives of building material in depth  <b>Objective:</b> Understand the application and uses of advanced building material in today’s building design</p> <p><b>Course content:</b></p> <p><i>Module I</i>  Fly ash Brick and their derivatives: Hollow blocks- single/double/multiple, fly ash tray  Clinker mix blocks  Precast Blocks- Lintels, septic tank rings, door frames, window sections, jail, parapets/balusters</p> <p><i>Module II</i></p>

	<p>Concrete and its varieties: ready to use concrete and their proportion, floating blocks with aerated concrete, quick set concrete etc.  A laboratory visit or a cement mixture factory visit is recommended  <i>Module III</i>  Aluminum sections and metal sections: varieties available in the market. Economic selection and design modification. Costing and average strength.</p> <p><b>Reference:</b>  <i>S.C. Rangwala, Engineering Materials , Charotar publishing house, Anand, 1982</i>  <i>S.C. Rangwala, Building Construction ,Charotar publishing house, Anand.</i>  W.B Mckay. Building construction. Vol-II, Vol-III</p>
<b>PRACTICAL / SESSIONAL</b>	
<p><b>BBD 1204</b></p>	<p><b>BASIC DESIGN – II (0-0-6)</b></p> <p><b>Aim:</b> The subject aims at Anthropometric studies.  <b>Objective:</b> Student should be able to calculate area for simple understandable spaces such as bed rooms, dinning, living, kitchen, toilet, verandah, etc. and should develop Preliminary ideas of circulation and flow aspects of simple habitations starting with a house, with the use of diagrammatic representation.</p> <p><b>Course content:</b>  <i>Module I:</i> Introduction to ergonomics with Preliminary ideas of space linkage and circulation aspects of simple habitats.  <i>Module II: Design of solids using Archimedean principles and principles of sciography.</i>  <i>Module III</i>  Making and breaking spaces with various planes or making spaces and voids within the design Assigning Utility to space. (Assigning of utility to space may be that of a house, memorial, bus shelter, park pavilion etc.)</p> <p>Exercises:  Ranging the spaces according to aesthetics, anthropometrics, social and engineering aspects.  Feed back and design integration.  Producing a final design in the form of sketch plans, sections, perspective and Model.</p> <p><b>Reference</b></p> <p>V.S Parmar, Design fundamentals in Architecture,  Somaiya publications private limited, New Delhi.  Francis D. K. Ching, Architecture-Form, Space and Order,  Van, Nostrand Reinhold company, New York.</p>

<p><b>BBD 1205</b></p>	<p><b>BUILDING CONSTRUCTION –I (0-0-6)</b>  <b>Aim:</b> To aware students with prevailing construction technology for small scale projects.  <b>Objective:</b> To shape their imagination with knowledge of buiding material and construction technology.  <b>Course content:</b>  <i>Module I</i>  Brick masonry: Masonry tools and equipment, binding and its principle, headers, stretchers, king and queen closers, English and Flemish bonds for corner, tee and cross junctions in 35 cms, 23 cms and size, section of a compound wall.  <i>Module II</i>  Stone masonry: Various types of stone dressing, plain beveled and rebated joints, dowels and cramps, quoins, headers and bond, Rubble, and Ashlar masonry walls, Walls with stone facing and brick backing.  <i>Module II</i>  Simple foundations: Simple foundation for masonry load bearing walls and piers.  Sessional work based on above topics.</p> <p><b>Reference Books:</b>  1. W.B Mckay. Building construction. Vol-I, Vol-IV  2. R. Barry. The Construction of buildings. Vol.1-Vol-IV,  The English Language book society, Crosby Lockwood staples, London.</p>
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<p><b>BBD1206</b></p>	<p><b>DESCRIPTIVE GEOMETRY – II (0-0-6)</b></p> <p><b>Aim:</b> Interpenetration of solids and representation in tow-dimension.  <b>Objective:</b> Student should be able to do analysis of complex forms (moldings, vaults etc) at different intersections.</p> <p>Course content:  <i>Module I</i>  Surface development of simple solid forms leading to complex forms including interpenetration.  <i>Module II</i>  Isometric and Axonometric projections.  Perspective – parallel, angular and three points. Exercise from simple solid geometrical shapes leading to perspective of building forms, simple rendering of perspectives.  <i>Module III</i>  Free hand perspectives Different drawings mediums. Measuring point Method, Three point Perspectives. Perspective of Buildings, and Interior, Rendering of Perspectives.</p> <p><b>References</b></p> <p>Engineering Drawing by N.D. Bhatt &amp; V.M. Panchal, Charotar Publishing House, Anand  Ch – 8, 9,10, 11, 12, 13, 14, 15 &amp; 16  N.D. Bhatt, Elementary Engineering drawing, Chartor publishing house.  A. C. Parkinson, London, Sir Isaac Pitman and sons. A First year Engg. Drawing.  Earl D. Black. Engg. and Technical Drawing.  S.C. Sharma, Engg. Drawing S. Chand &amp; Company, New Delhi</p>
<p><b>BBD 1207</b></p>	<p><b>BUILDING DESIGN PRESENTATION – II (0-0-3)</b></p> <p><b>Aim:</b> To study and understand the use of colors and rendering techniques to prepare 2 &amp; 3 dimensional presentations. The subject also aims to enhance the skill in Visual perceptions of design theories.  <b>Objective:</b> Study of colors and colour schemes. Enhance perception with rendering of drawing, sciography, digital photography</p> <p><b>ourse content:</b>  <i>Module I</i>  Composition with complementary, split and analogous colours.  Exercises in 2 &amp;3 dimensional compositions with effects of light and shade Sketching of simple natural / manmade forms in combination with trees, human figures etc using pencil  <i>Module II</i>  Rendering buildings and other manmade forms in combination with natural elements using pen and ink, charcoal, water color Study of scales and proportions with perspectives of simple geometric forms.</p>

	<p><i>Module III</i>  Photo editing using software and digital photography.  Measured drawing sessions, Two dimensional compositions on straight linear form.  Three dimensional composition on convex-concave and curvilinear forms</p> <p><b>References:</b>  <i>James Richards, Free hand drawing and Discovery.</i>  <i>Architectural Graphics, by Francis D.K.Ching.</i></p>
<p><b>BBD 1208</b></p>	<p><b>WORKSHOP – II (BUILDING MODEL MAKING) (0-0-3)</b>  <b>Aim:</b> Work with model making materials to scale down actual imagination into 3D models.  <b>Objective:</b> Practical exposure of model making and utilize the previous skills leaned in workshop I</p> <p>Course content:  <i>Module I:</i>  Working with thermocoal, cutting with hot wire cutter/knives/blades  Carving in 2D, making small objects like crown/fish etc in 3D.  <i>Module II:</i>  Colored paper model : 2D model on flat surface. Classroom walls could be showcase of such imaginations.  Carving out 3D models with the help of plan and elevation on 2D paper. Ex: Collapsible models.</p> <p><i>Module III:</i>  Use of Mount Board to make box shaped models/staircase or detail model. Instructions on the use of tools such as craft knives, hot wire cutter, small bench drill, fretsaw. Glue gun, and materials such as Clay, Thermocol, Styrofoam, Paper and Softwood etc. for making Building design/models.</p>