

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, MAHARASHTRA

DETAILED SYLLABUS – BACHELOR OF ARCHITECTURE (B. Arch) 2019-20

Important notes:

1. An attempt is made to let the detailed content to be suggestive and not prescriptive. The nature and number of assignments, test, tutorials etc. are not specified intentionally. Every Institute and teacher should design these for their class. Every semester the exercises will be different and thus plagiarism could be avoided.
2. It is expected of all teachers to set up the exercises, tests and tutorials etc. in such a manner that they relate to student's own Design projects attempted in earlier semesters.
3. The detailed content for each course / subject in the document specifies the "Minimum" content to be disseminated to students. Every Institute depending on their Philosophy and Vision statement should make an attempt to go beyond this minimum content mentioned in the syllabus.
4. The content of each subject/course is divided into number of Credit point blocks relevant to the Credits allotted to that course/subject. For theory courses, the distribution of questions asked and marks allotted to topics should be proportionately spread over the content of each credit point in Mid Semester and Semester End Examinations. Questions asked and marks allotted to topics shall address all Credit point blocks of that course/subject at the Semester End Examinations.
5. For every "Elective" course / subject the student must attempt one of the three topics offered. His / her choice of the topic from amongst the three topics listed should be made at the beginning of the semester and conveyed to the Controller of Examinations of the University.
6. However the student may choose to attend more than one topic if he / she desires in an effort to acquire more knowledge. Also Institutes may offer topics other than mentioned in the syllabus and students may attend these extra classes voluntarily.
7. All courses / subjects are divided into three categories:
 - a. Theory courses / subjects (TH) – Student's work will comprise of class tests, tutorials, assignments done in the class + attempt a Paper in the Mid-Semester examinations + Attempt a Paper at the end of Semester examinations. The evaluation of student's performance will be marked separately for continuous assessment during the class sessions – CA1: before Mid-Sem Exams, Mid-Sem exams; CA2: After Mid-Sem exams and End –Sem exams. The marks for CA1, Mid-Sem exams and CA2 should be displayed and performance should be discussed with the students.
 - b. Studio Term Work courses (STW) - Student's work will comprise of class tests, tutorials, assignments done in the class. The assignments should reflect successful application of the knowledge in solving real life problems. The evaluation of student's performance will be marked separately for continuous assessment during the class sessions + assessment by an Internal & External Examiner at the End of Semester examinations where the student will not be present at the time of assessment. The work of the students shall be either in the form of manually drawn sheets, Journals, etc. or it shall be Acceptable in Digital format. Institutes have choice of selecting mode of submissions in any form.
 - c. Studio – Viva courses (SV) - Student's work will comprise of class tests, tutorials, assignments done in the class. The evaluation of student's progress will be marked separately for continuous assessment during the class sessions + Jury / Viva conducted by an Internal & External Examiner at the End of Semester examinations where the student will present his / her work in person. The work of the students shall be either in the form of manually drawn sheets, Journals or it shall be Acceptable in Digital format. Institutes have choice of selecting mode of submissions in any form.
8. The Internal & External examiner mentioned above is generally defined as follows:
 - a. Internal Examiner is the Teacher teaching that course / subject to that class during the semester.
 - b. External Examiner shall be a person not teaching in the concerned Institute. He / she should be a qualified Architect registered with the Council of Architecture, New Delhi and with a minimum of 5 years' experience in teaching – profession. For allied subjects the person could be an expert in that field with 5 years of experience. External examiner for course / subject "Thesis" shall be a qualified Architect registered with the Council of Architecture, New Delhi and with a minimum of 10 years' experience in teaching – profession.

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FINAL Teaching - Evaluation Scheme for B. Arch (December 2018)												
SEMESTER III												
Course Code	Subject / Course	L/w	S/w	T/w	CT	Cr	T M	CA 1	MSE	CA2	ESE-P	ESE-SV/STW
BA18031S	Architectural Design II	0	10	10	SV	5	250	50	0	50	0	150
BA18032S	Building Construction Technology-III	0	6	6	SV	3	150	30	0	30	0	90
BA18033T	Building Materials -III	2	0	2	TH	2	100	10	20	10	60	0
BA18034T	Theory of Structure-III	2	0	2	TH	2	100	10	20	10	60	0
BA18035S	Architectural Drawing and Graphics-III	0	4	4	STW	2	100	20	0	20	0	60
BA18036T	Building Services - I	2	0	2	TH	2	100	10	20	10	60	0
BA18037T	Culture & Built Form-III	2	0	2	TH	2	100	10	20	10	60	0
BA18038S	Elective III (Any One from Below) (A) Metal Work (B) Wood work (C) Ceramics & Pottery	2	0	2	STW	2	100	20	0	20	0	60
		10	20	30		20	1000					

SEMESTER IV												
Course Code	Subject / Course	L/w	S/w	T/w	CT	Cr	T M	CA 1	MSE	CA2	ESE-P	ESE-SV/STW
BA18041S	Architectural Design III	0	10	10	SV	5	250	50	0	50	0	150
BA18042S	Building Construction Technology-IV	0	6	6	SV	3	150	30	0	30	0	90
BA18043T	Building Materials -IV	2	0	2	TH	2	100	10	20	10	60	0
BA18044T	Theory of Structure-IV	2	0	2	TH	2	100	10	20	10	60	0
BA18045S	Surveying and Levelling	0	4	4	STW	2	100	20	0	20	0	60
BA18046T	Building Services - II	2	0	2	TH	2	100	10	20	10	60	0
BA18047T	Culture & Built Form-IV	2	0	2	TH	2	100	10	20	10	60	0
BA18048S	Elective IV (Any One from Below) (A) Barrier Free Architecture (B) Art History (C) Ergonomics	2	0	2	STW	2	100	20	0	20	0	60
		10	20	30		20	1000					

Abbreviations:

L/w	Number of Clock Hours of Lectures per week for the Subject / Course
S/w	Number of Clock Hours of Studios per week for the Subject / Course
T/w	Total Number of Clock Hours per week for the Subject / Course
CT	Subject / Course Type: Theory (TH) or Studio Term Work (STW) or Studio Viva (SV)
Cr	Total Number of Credits allotted for the Subject / Course in the Semester
T M	Total Number of Marks allotted for the Subject / Course in the Semester
CA 1	Marks allotted for Continuous Assessment during the Semester before Mid Semester examinations the Subject / Course in the Semester
MSE	Marks allotted for Mid Semester examinations for the Subject / Course in the Semester
CA2	Marks allotted for Continuous Assessment during the Semester after Mid Semester examinations the Subject / Course in the Semester
ESE-P	Marks allotted for End of Semester examinations Paper for the Subject / Course in the Semester
ESE-SV/STW	Marks allotted for End of Semester examinations Studio Sessional work or Studio Viva for the Subject / Course in the Semester

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Detailed Content

Second Year B. Arch. - Semester 3

BA18031S: Architectural Design - II

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Paper	ESE-SV/STW
1	BA18031S	Architectural Design -II	0	10	10	SV	5	250	50	0	50	0	150

Learning Objectives:

After successful completion of this course, student should be able to:
 Develop basic skills of design and design expression. Introduction to design grammar and principles of design.

Design Agenda: Climate /user centric Multifunctional single unit.

Detailed Syllabus:

1	Introduction to design thought process. Matrix, Idea board & formulating Requirements. Site Analysis. Study of Context, Physical environment, Tradition, Culture w.r.t. site
2	Meaning of the word typology with a formal introduction to responses to multiple function accommodated within a Single unit
3	Ability to learn element involved in the evolution of 'Typology'
4	Study of Climatic conditions. Studying Climate Responsive solutions as regards to design, materials etc. Freezing basic design strategy Basic Circulation pattern. Concept to design process. Need of use of innovative materials. Elementary Services like water supply & drainage
5	Finding case studies of ideal examples and reproduction of the same (master architect's works)- drawings and models.
6	Design Process
Studio Exercises suggested: Design of Multi-function spaces as decided by the Institute. 1 no Minor Project (can be a Time problem) 1 no Major Project based on above Modules with creative presentation of drawings & models.	

Recommended Reading:

1	Ching, Francis D.K.; Architecture Form, Space and Order.
2	Dofsky, Bernard; Architecture without Architects.
3	Rasmussen, Steen Eiler; Experiencing Architecture
4	Gideon, Siegfried; Space, time & Architecture.
5	Neuferts Architects Data
6	Chiara, Joseph De / Panero, Julius / Zelink Martin; Time Savers Standards for Interior design and Space Planning.
7	David Adler, Metric Handbook Planning & Design Data
8	Jonathan A. Hale -Building Ideas. An introduction to Architectural Theory.
9	William J.J. Synectics: The Development of Creative Capacity
10	Elvadine R. Seligmanann : Reaching Students through Synectics: A Creative solution
11	Jyoce, Bruce and Weil Marsha .Synetics Involving creative thought
12	Climate Responsive Architecture
13	Architects monograms & monographs
14	Pattern Language
15	21 notes for 21st Century - Rafael Moneo
16	Anxiety of Architecture – Rafael Moneo

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BA18032S: Building Construction and Technology - III

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18032S	Building Construction Technology -III	0	6	6	SV	3	150	30	0	30	0	90

Learning Objectives:

After successful completion of this course, student should be able to:
 Understand materials used in construction, principles of construction, building systems and simple elements of buildings and their behavior and Study of Standard Construction practices adopted.

Detailed Syllabus:

1.	Framing of openings, Doors, windows in using various materials like wood, steel, aluminum, etc. Steel Door-Sliding, Rolling, safety doors. Steel Window-Z section glazed open able window, glazed louvered window. Aluminum window- Aluminum & Glazed sliding window with 2/3 runners.
2.	Interior construction- details of construction of False ceilings & partitions in wood, steel, aluminum, glass, wood base boards, other manufactured boards, paneling, dry wall construction. Interior construction - construction of furniture, cabinets, cupboards in wood, steel, various types of boards and other manufactured material.

Recommended Reading:

1.	Elements of structure by Morgan
2.	Building construction by Punmia
3.	Building construction by Sushil Kumar
4.	Building construction by Bindra Arora
5.	Structure in Architecture by Salvadori
6.	Building construction by Mckay W. B., Vol. 1 to 4
7.	Construction of Building by Barry, Vol. I to V
8.	Construction Technology by Chudley R. Vol. I to IV
9.	Building Construction Illustrated – Ching Francis D.K.
10.	Elementary Building Construction by Michell

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BA18033T: Building Materials - III

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18033T	Building Materials - III	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand different materials used in construction, their properties, characteristics, behavior and their specific uses in the Building industry.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Manufactured products like Tiles, processed wood products. Applied finishes like plasters. The properties, characteristics, Grades, proportioning of ingredients, advantages/disadvantages & use. Applied finishes like plasters-POP, Gypsum, and wall care putty etc. The properties, characteristics, Grades, proportioning of ingredients, advantages/disadvantages & use.
2.	<ul style="list-style-type: none"> Decorative & protective finishes, Paints -Protective coating, Paints, water paints, distempers & cement based paints, Emulsion paints, Anti corrosive paints, Dam proofing finishes. Constituents of paints, properties, characteristics, Grades, Selection criteria, advantages/disadvantages & use. Varnishes (Oil & Spirit) - Ingredients, properties, characteristics, Selection criteria, advantages/disadvantages & use. Processed wood products-Plywood, Veneers, Laminates, Composite boards (Insulating boards, MDF boards, Fiber board, particle board):-The properties, characteristics, Types, Fixing methods, advantages/disadvantages & use.

Recommended Reading:

1.	Elements of structure by Morgan
2.	Structure in Architecture by Salvadori
3.	Building construction by McKay W. B., Vol. 1 to 4
4.	Construction of Building by Barry, Vol. I to V
5.	Construction Technology by Chudley R. Vol. I to IV
6.	Building Construction Illustrated – Ching Francis D.K.
7.	Elementary Building Construction by Michell

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BA18034T: Theory of Structure - III

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18034T	Theory of Structure - III	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand the structural systems and their behavior.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Introduction to Structural components of Building. RCC Design philosophies. Working stress, limit state method. Introduction to different grades of concrete, steel. Characteristic strength of materials. Balanced section, over reinforced sections and under reinforced sections. Introduction to IS Code 456 for RCC design. Singly Reinforced beams. Stress strain distribution for simply supported beam. Design of singly reinforced beam using limit state method. Problems on Singly Reinforced beam analysis - Finding ultimate moment of resistance, finding area of steel. Doubly Reinforced beams. Situations when doubly Reinforced beams are used. Doubly Reinforced beams. Stress strain distribution for simply supported doubly reinforced beams. Design of doubly reinforced beam using limit state method. Problems on Doubly Reinforced beam analysis- Finding ultimate moment of resistance, finding area of steel for the section. Introduction to columns. Buckling of column for Different end conditions. Axially loaded columns, eccentrically loaded columns. Axial and biaxial bending. Problems on - Design of axially loaded columns, Design of columns subjected to Bending about axis using limit state method.
2.	<ul style="list-style-type: none"> Introduction to slabs. Different types of slabs. Classification of slabs. Types of reinforcement in one way and two way slabs. Sketches for the laying of reinforcement in one way and two way slab. Problems on - Design of one and two way reinforced slabs (simply supported, restrained continuous) by limit state method only. Introduction to staircase. Types of staircase. Sketches showing Different component parts of staircase with their terminologies. Reinforcement placing for major types like Doglegged, folded staircase etc.

Recommended Reading:

1.	Strength of Materials – by Khurmi R.S.
2.	Applied Mechanics and Strength of Material – by Khurmi. R. S.

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BA18035S: Architectural Drawing and Graphics-III

Course Information:

Sem	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18035S	Architectural Drawing and Graphics-III	0	4	4	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Understand technical drawings and computer generated representation as designing tools.
To comprehend computer modeling and visualization as a way of evaluating design alternatives.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Introduction and use of Computer aided drafting (CAD) software. 2D Drawing using CAD software. Model space, Paper space, Parametric Blocks, Attributes, Templates, Drafting and Printing, Printing to the scale. 2D drawing of orthographic projections, section of solids, intersection etc done in previous semesters using computers. Coordinate Space and metric, Geometric Primitives and Symbols, Object Properties, Basic Transformations absolute and referential, Editing, Segmentation by Color, layering and grouping, Printing / Plotting. Introduction, Importance and use of 3D softwares like Autocad, trimble sketchup or similar softwares used in the industry. Computer aided architectural modeling: 3D Form / Space, Structure, Planes and Solids, Grids etc. Introduction to BIM softwares like Revit Architecture or Archicad in Industry. Definition of Space, Articulation, Circulation, Movement, 3D Viewing, Orthographic and Perspective projection, Camera control, Viewpoint, Coordinate Systems orientation and Transformations etc. 3D construction from profiles, extrusion, revolution, interpolation, Surface Modeling, Elements, Planar and curved surfaces etc. Model segmentation by grouping, Solid Modeling, Addition, Subtraction and Intersection of solids by using google sketchup.
2.	<ul style="list-style-type: none"> Construction of architectural models as a spatial database of formal elements and structure. Computer aided rendering and animation: Basic Shading models, Light Models, Sun-path simulation, Camera control and creation of Spatial sequences with light and shade etc. Constructing three dimensional scale models of selected works of architecture. Exploding model into tangible components Designing a small spatial composition using a set of generic formal elements with simple functional requirements. Preparing working drawings and details of architectural design projects of load bearing structures done in previous semesters elements and structure

Recommended Reading:

1.	Architectural Graphics : C. Leslie Martin
2.	Perspective for the Architect : Thames and Hudson
3.	Rendering with Pen and Ink, Jacoby
4.	Architectural Graphics – Ching Frank
5.	Sketchbook by Milind Mulik
6.	Pencil Sketching - Vyaktichitre by Pundalik Vaze
7.	Water Colour by Milind Mulik
8.	Colour Pencil by Rahul Deshpande & Gopal Nandurkar

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BA18036T: Building Services - I

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18036T	Building Services - I	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand requirement of **Water Supply and Sanitation**.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Water Supply: Sources of water. Tapping of water mains on street by means of Ferrule. Distribution of water supply in the premises & within the building. Water for drinking & other uses. Characteristics purity of water, standards for purity of water, methods of purification of water. Storage of water. Sump/suction tank, Overhead water storage tank/pressure tank, community overhead water storage tanks. Lifting of water from the underground tank to the overhead tank with the use of pumps. Determination of demand and requirement standards. Hot water supply using conventional and non-conventional energy sources. Direct and Indirect system of hot water supply. Circulation systems i.e. ring system, up feed system, drop system, etc. Internal Plumbing installations. Pipes and piping network, Materials used for piping i.e. Galvanized Iron, P.V.C, Copper, etc. Classification of pipes, specials and joinery used in Plumbing. Installation of the network- open and concealed. Various control valves, flushing cisterns and flush valves. Taps, faucets and other fittings, mixing units for wash-hand basins, kitchen sinks, shower units, baths etc. Internal plumbing layouts, determination of pipe sizes for desired distribution.
2.	<ul style="list-style-type: none"> Drainage & Sanitation: Systems of disposal of Drainage & waste water within a building & within premises. Septic tanks its function and design. Bio gas plants, effluent treatment tanks, sewage treatment plants. Sanitary fittings – Water Closets, Bidets, Wash Hand Basins, Bath Tubs, Urinals, etc along with their working & installation. Different traps, their uses and functioning, classification and materials of pipes, specials, jointing and installations. Single and double stack systems. Location and use of appurtenances i.e. inspection chambers, manholes, disconnecting chambers, ventilation shaft. Storm water drainage system. Sanitation layouts for installation in building and in premises. Collection and disposal of organic and in-organic waste. Vermiculture and composting. Equipment's & systems for Refuse & garbage disposal i.e. Incinerators, compactors and refuse chute. Introduction to Rain water harvesting. Design of Disposal of Rain & surface water in a campus. Rainwater harvesting & other methods of conserving water resources

Recommended Reading:

1.	Plumbing Engineering by Dr. Subhash Patil
2.	International Plumbing Code by Indian Code Council
3.	Building Construction Illustrated by Dr. F.D.K Ching
4.	Building Construction by Sushil Kumar
5.	Building Construction by B.C Punmia
6.	Building Construction by Rangwala

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BA18037T: Culture & Built Form - III

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18037T	Culture & Built Form - III	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
 Development of architecture and structural systems based on knowledge of materials and technology developed from Contextual to the social and cultural history of the place. Period from 700 CE to 1500 CE

Detailed Syllabus:

1.	<ul style="list-style-type: none"> • Early Islamic Architecture: Introduction to Islamic culture worldwide. Emergence of Islam as a religion and its philosophy: Evolution of building types in terms of form and function; mosque, tomb, palaces. Salient characters of Islamic Architecture. Rise of Caliphs, Umayyads, Abassid Dynasty (750 - 1258CE) Eg.- Dome of The Rock, Umayyad Mosque in Damascus (709 - 715 CE), Great Mosque of Samara 836 CE, Great Mosque of Cordoba 784 CE, Great Mosque of Ishfan (840 CE), City of Baghdad, Palace of Alambara, Elements – Muquarnas, Iwan. Early Islamic architecture in India: Establishment of Delhi sultanate i.e. Imperial Style. Evolution of Architectural Monuments under the Slave, Khilji, Tughlaq, Sayyed and Lodhi dynasties. Typical examples of each dynasty. • Temple architecture from 700 CE to 1500 CE • INDO ARYAN or NAGARA STYLE: Temple architecture of Solanki (Gujarat), Kalinga (Orissa), Bundellas (Khajuraho Group) Dynasty E.g. Lingaraja Temple Bhuwaneshwara, Sun Temple Konark, Sun Temple, Modhera, step wells • Shankaracharya in South, Era of saints Dnyaneshwar, Tukaram. • Rashtrakutas (750 CE to 973 CE). Kailashnatha at Ellora, temples of Pattadakal • Dravidian Style 400 CE to 1500 CE: Evolution and form of gopuram. Dravidian Dynasties: Cholas(700 – 1150, Pandyas (1000 - 1150 CE), Late Chalukyan: Hoysala Dynasty : Halebid, Somnathpur, Vijayanagara Style (1350 - 1565 CE) – Hampi, Briha Temple of Tanjore, Madurai Temple complex. • Buddhism outside India: Sri Lanka, China, Japan, Afghanistan – Bamiyan Buddhas, Ankor Wat (802 - 1431 CE)
2.	<ul style="list-style-type: none"> • Early Christian & Romanesque Architecture: Introduction to society and culture of 400 -1150 CE in Europe. Early Christian Architecture Development of Early Christian Church from Roman Basilica Salient building – St. Peter’s Basilica. Romanesque Architecture. Development of Romanesque architecture from Early Christian architecture • Byzantine Architecture: 330 CE - 1453 CE: Contribution of Byzantine architecture in the development of structural system – dome construction over square plan, Adoption of Greek cross in church layout Use of mosaic and mural in interior. Salient buildings St.Vitale Ravenna, Hagia Sophia, Istanbul; St. Mark’s Cathedral, Venice • Romanesque in Europe – 800 CE to 1000CE Italy, France: Development of style as Architectural characters. Typical style illustrating the style –Speyer Cathedral in Germany, Pisa Cathedral complex, S. Pavia, S. Michelle. Pilgrimage churches –Spain. North and South France cathedrals typical examples such as Angouleme Cathedral & Abbey Aux Home Cathedral. Romanesque in British Isles – Secular and Non-Secular Buildings Typical examples such as – Canterbury Cathedral, Durham Cathedral, Norman Castles- Tower of London, Windsor Castle and Manor Houses. • France, Italy, Spain, Poland, Germany • Gothic Architecture: Introduction to society and culture of 1150 – 1350 CE in Europe - Italy, Spain, England, Romania, Austria Belgium. Development of Gothic church and its new elements. Pointed Arch window, flamboyant window, rose window, glazed window, stone and metal trellis. Different arch types – lancet, equilateral, depressed, Trefoil arch. Cluster column and intersecting vault roof, Clerestory window and triforium, Flying buttress. entrance of church • Salient features of important buildings Cathedrals of St. Dennis, Cathedrals of Chartres, Cathedrals of Notre Dame (Paris) Cathedrals of Reims • Meso American: Mayan civilization – Temple of Inscriptions, Palenque, Tikal.

Recommended Reading:

1.	Geoffrey and Susan Jellicoe, “Landscape of Man”
2.	Spiro Kostof “History of Architecture”
3.	Global History of Architecture – Franchis Ching
4.	Indian Architecture – Percy Brown
5.	History of Architecture – Bannister Fletcher
6.	Satish Grower, Islamic Architecture in India
7.	R.Nath, History of Mughal Architecture Vol-I,II,III. Abhinav pub. New Delhi
8.	History of Architecture in India by Christopher Tadgell
9.	Early India by Romila Thapar
10.	The Wonder that was India by A.L. Basham

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BA18038S: Electives – III (A) METAL WORK
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18038S	Electives – III (A) Metal Work	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Do some hands on work with various metals to understand the processes normally used for making metal objects.
Understand advantages and limitations of workability of various metals. To be able to make study models and prototypes in metals.

Detailed Syllabus:

1.	Using Metals: primarily Steel. Practicing working with tools used for specific material. Listing innovative use and limitations of these materials in presentations. Understand the importance of material in presentation.
2.	Exercises in making 2 dimensional and 3 dimensional objects – models using these materials. Finishing, Painting, creating textures, ornamentation etc.

Recommended Reading:

1.	The complete book of drawing techniques, by Eugene Felder & Emmett Elvin
2.	Paper Scissor Glue by Catherine Norman, Ryland Peters & Small
3.	Color on Metal by Tim Mc Creight & Nicole Bsullak
4.	Books for Building Construction technology and Materials, History of Architecture, etc.

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BA18038S: Electives – III (B) WOOD WORK
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18038S	Electives – III (B) Wood work	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:

Do some hands on work with various types of wood - timber to understand the processes normally used for making metal objects. Understand advantages and limitations of workability of various types of wood. To be able to make study models using wood.

Detailed Syllabus:

1.	Using wood, Practicing working with tools used for specific material. Listing innovative use and limitations of these materials in presentations. Understand the importance of material in presentation.
2.	Exercises in making 2 dimensional and 3 dimensional objects – models using these materials. Finishing, Painting, creating textures, ornamentation etc.

Recommended Reading:

1.	The complete book of drawing techniques, by Eugene Felder & Emmett Elvin
2.	Paper Scissor Glue by Catherine Norman, Ryland Peters & Small
3.	Color on Metal by Tim Mc Creight & Nicole Bsullak
4.	Books for Building Construction technology and Materials

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BA18038S: Electives – III (C) CERAMICS & POTTERY
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18038S	Electives – III (C) Ceramics & Pottery	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Know more about an ancient art form. Relate ceramics in understanding 2D and 3D forms, textures, colors, articulation and decoration. To be able to use this art form as a tool to explore forms and shapes.

Detailed Syllabus:

1.	A brief history of art form – Ceramics, its development, its use in Architecture.
2.	Introduction to various materials used. Understanding processes of molding, forming, turning to make objects. Processes of cold ceramics and firing – kilns, Glazing, painting etc. Make small objects like pots, jewelry, artefacts etc.

Recommended Reading:

1.	Ceramics for Beginners by Susan Halls
2.	The Ceramics Bible: The Complete Guide to Materials and Techniques by Louisa Taylor
3.	The Encyclopedia of Pottery Techniques: A Unique Visual Directory of Pottery by Peter Cosentino
4.	Potter's dictionary of materials and techniques by Frank Hamer

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Second Year B. Arch. - Semester 4

BA18041S: Architectural Design - III

Course Information:

Sem	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18041S	Architectural Design -III	0	10	10	SV	5	250	50	0	50	0	150

Learning Objectives:

<p>After successful completion of this course, student should be able to: To understand single function public buildings or intervention by understanding surrounding. Design Agenda: Singular function/ low rise public building.</p>

Detailed Syllabus:

1	Site analysis with respect to surrounding environment, tradition, culture, Climatic considerations, interdependency, edge, fenestration and building elements.
2	Considering structural solutions & materials for complex Architectural spaces. Site, building, space, structure, form, character, correlations, light, view.
3	Design Development understanding traditional response of space in architecture.
4	Case studies to understand social, cultural, economic, socio-cultural, socio-economic, technological aspects of Design
<p>Studio Exercises suggested: Design of Single function public building space as decided by the Institute. 1 no Minor Project (can be a Time problem) 1 no Major Project based on above Modules with creative presentation of drawings & models.</p>	

Recommended Reading:

1	C.M. Deasy -Design for Human Affairs.
2	Pierre Von Meiss -Elements of Architecture from form to place.
3	Yatin Pandya- Elements of Space Making.
4	Paul Lassau – Graphic Thinking for Architects and Planners.
5	Peter Pearce, Structure in Nature – Strategy for Design
6	Peter Streens, Patterns in Nature.
7	Anthony Antoniadis - Poetics in Architecture: Theory of design
8	Am heim Rudolf, Visual Thinking.
9	Jonathan A. Hale -Building Ideas. An introduction to Architectural Theory.
10	William J.J. Synectics: The Development of Creative Capacity
11	Elvadine R. Seligmanann : Reaching Students through Synectics: A Creative solution
12	Jyoce, Bruce and Weil Marsha - Synectics Involving creative thought
13	Complexity & Contradiction - Robert Venturi
14	Architecture of the city – Aldo Rossi
15	Site planning – Kevin Lynch

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BA18042S: Building Construction and Technology - IV

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18042S	Building Construction Technology -IV	0	6	6	SV	3	150	30	0	30	0	90

Learning Objectives:

After successful completion of this course, student should be able to:
Understand materials used in construction, principles of construction, building systems and simple elements of buildings and their behavior.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> • Framed type construction in R.C.C. with reinforcement details- Footings- Isolated (Stepped, Sloped & Box type), Eccentric, Combined, Raft, Strap, Strip. • Vertical (Column) –Different shapes like-square, rectangular, circular, Tee, Cross & L- Shape. • Horizontal frame members (Beams) - Cantilever, Simply supported, Fixed, Continuous.
2.	<ul style="list-style-type: none"> • R.C.C. Slabs-One way, two ways, Continuous, Cantilever etc. • R.C.C. members -Chajjas, Pardis, Walls, Loft, Poarch, Pergola. • R.C.C. Staircases -Doglegged, Spine beam, Open well, Folded type etc.
3.	<ul style="list-style-type: none"> • Temporary supports like formwork, strutting, scaffolding.

Recommended Reading:

1.	Elements of structure by Morgan
2.	Concrete Technology by M.S.Shetty
3.	Building construction by Punmia
4.	Building construction by Sushil Kumar
5.	Building construction by Bindra Arora
6.	Structure in Architecture by Salvadori
7.	Building construction by Mckay W. B., Vol. 1 to 4
8.	Construction of Building by Barry, Vol. I to V
9.	Construction Technology by Chudley R. Vol. I to IV
10.	Building Construction Illustrated – Ching Francis D.K.
11.	Elementary Building Construction by Michell

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BA18043T: Building Materials - IV

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18043T	Building Materials - IV	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand different materials used in construction, their properties, characteristics, behavior and their specific uses in the Building industry.

Detailed Syllabus:

1.	<ul style="list-style-type: none"> • Plastics- The properties, characteristics, composition, classification - Polymer types, thermosetting and thermoplastics, resins, common types of moldings, fabrication of plastics, polymerization and condensation, plastic coatings. Advantages/disadvantages & use in building industry. • Composite materials; classification, properties and uses- linoleum, plastic coated paper, polyurethane sheets, flexicon sheet , reinforced plastic and PVC.
2.	<ul style="list-style-type: none"> • Glass and glass products - Composition and fabrication of glass, Types of glass, wired glass, Fiber glass, Rock wool, Glass Crete blocks, Toughen Glass , Sun control Glass, Structural glass, their properties and uses in buildings. • Construction chemicals, Sealants for Constructional joints: different types, properties, application accessories admixtures, adhesives, the properties, characteristics, Grades, proportioning of ingredients, advantages/disadvantages & use.

Recommended Reading:

1.	Elements of structure by Morgan
2.	Building Materials by Rangwala.
3.	Building materials in India (50 years)
4.	Structure in Architecture by Salvadori
5.	Building construction by Mckay W. B., Vol. 1 to 4
6.	Construction of Building by Barry, Vol. I to V
7.	Construction Technology by Chudley R. Vol. I to IV
8.	Building Construction Illustrated – Ching Francis D.K.
9.	Elementary Building Construction by Michell

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BA18044T: Theory of Structure - IV

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18044T	Theory of Structure - IV	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand behavior of advanced elements in structure. The study of steel as structural material and the role of properties of material and behavior of elements in evolution of structural system

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Determinate and indeterminate structures, finding indeterminacy of structures. Advantages and disadvantages of indeterminate structures. Analysis of indeterminate structures. Introduction to stiffness and distribution factors, introduction to moment distribution factors, introduction to moment distribution method. Indeterminacy of a frame, comparison of post and lintel system and portal frames. Importance of portal frames in resisting horizontal forces. Arch as a curved element. Arch in history, efficiency of an arch. Three hinged arch. Simple problems to illustrate the importance of the shape of an arch, rise end conditions and loading.
2.	<ul style="list-style-type: none"> Steel as a structural material, structural system in steel with case studies. Analysis and design of steel girders & columns using IS-specified & handbook of steel sections Designing & detailing the bolted connections, design of simple welded connections.

Recommended Reading:

1.	Strength of Materials – by Khurmi R.S.
2.	Applied Mechanics and Strength of Material – by Khurmi. R. S.

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BA18045S: Surveying and Levelling

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18045S	Surveying and Leveling	0	4	4	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Understand Methods of recording and representing spatial information. To know different types of land surveys done for measuring the land. Importance of Site visit and recording analysis data. Use maps, ownership records from Government records. Understand the physical features at site. To explore site conditions to benefit the Architectural design.

Detailed Syllabus:

1.	Reconnaissance and need for surveying. Types of information recording: surveys, photography etc. Information about older surveying methods like Chain survey, Compass survey, Plane table, Theodolite and contour surveys. Various equipment used in Surveying. Introduction to modern methods of Digital surveys like "Total Station", etc. Understanding the output of the digital surveys and interpreting and using the digital maps and levels (topography) of site information.
2.	Understanding and using the maps issued by various Government Records. Understanding and using the information about area and other information issued by various Government Records. Types of maps, drawings and digitized data. Reading information from visual records, analysis, co-relations etc. Tools & Techniques employed at various scales and complexity of information. Degrees of accuracy and errors. Inquiry of Infrastructure available on site.

Recommended Reading:

1.	Site planning by Kelvin Linch
2.	Surveying and levelling by B.C. Punmia
3.	Surveying and levelling by N.N.Basak
4.	Surveying and Levelling by Kulkarni and Kanitkar

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BA18046T: Building Services - II

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18046T	Building Services - II	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Understand Environmental control systems – **Lighting, Illumination & Electrical Services.**

Detailed Syllabus:

1.	<ul style="list-style-type: none"> Natural Light & Illumination - solar orientation, shading devices, radiation, outdoor indoor illumination, solar energy and its technical applications. Studies through built environment, case analysis, theory and its application, models and testing. Artificial Lighting & Illumination. Physics of light, Human – visual comfort, Sources of Artificial Illumination, their characteristics, Illumination level standards, Lighting design: Studies through built environment, case analysis, theory and its application, models and testing, their layouts and requirements within building systems, co-ordination to building systems
2.	<ul style="list-style-type: none"> Electrical and communication services. Electrical Distribution – Mains supply, Height-Lt consumer, distribution within premises and within a building: electrical load estimation & distribution. Equipment like switches, luminaries, safety devices, fans, etc. Electrical layouts for premises & within a building. Other distribution systems for networking, Internet etc.

Recommended Reading:

1.	National Building Code 2016
2.	Mechanical and Electrical Equipment for Buildings by Walter T. Grondzik, Alison G. Kwok, Benjamin Stein

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BA18047T: Culture & Built Form - IV

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18047T	Culture & Built Form - IV	2	0	2	TH	2	100	10	20	10	60	0

Learning Objectives:

After successful completion of this course, student should be able to:
Development of architecture and structural systems based on knowledge of materials and technology developed from 1300 CE to 1800 CE contextual to the social and cultural history of the place.

Detailed Syllabus:

1.	<p>Provincial power and impact of regional art, technology & culture – 1300 CE to 1800 CE Provinces such as Bengal, Gujarat, Malwa, Deccan, Sasaram and Important examples from each region Architectural Treaties and Writings: al-Bīrūnī (d. 1048) - Kitāb fi Tahqīq ma li'l-Hind (Researches on India), Fazl, Abu'l (1877). Akbarnamah (Persian), Vol. 1. Asiatic Society, Calcutta. (Online book), Fazl, Abu'l (1879). Akbarnamah (Persian), Vol. 2. Asiatic Society, Calcutta, Akbar nama by AbulFazl, Travel in the Mughal empire, Travels of Pietro Della Valle in India.</p> <p>Mughal rule in India and its Political and cultural impact- 1400 CE to 1800 CE - synthesis of Hindu Muslim culture Evolution of Architecture during Mughal time in form of palaces and gardens. Rule of Babur and Humayun and their contribution to architecture, prominent example. Reign of Akbar, Jahangir, Shahajahan and their contribution- Study of Forts, Palaces, Mosques and Moghul Gardens, Refinement in Art and Craft, Important buildings to understand Mughal Style</p> <p>Contemporary Maratha Architecture- Political, Social, Cultural conditions, Important Forts/Shore Forts, Palaces, Wada, Royal Residences Regional art, Craft, Material, technology and Construction methods</p> <p>Colonial Architecture – India - Colonial architecture, Indo Saracenic architecture, Indo gothic, French, Dutch and Portuguese architecture in India, Architectural Treaties and Writings Architectural features Prominent Sites : French colony Pondicherry, The Basilica of Bom Jesus (Good Jesus), Goa Portuguese, Forts in Madras, Calcutta, Bombay</p>
2.	<p>Basic Introduction to Renaissance Introduction to society and culture of 1400 - 1800 CE Renaissance: Its birth and impact. The rediscovery of the classical past and its impact on art, architecture, science & philosophy. Humanism. Mannerism. The Renaissance in the rest of the Europe. The masters of Renaissance, Works of Brunelleschi, Leon Alberti, Palladio, Bramante, Bernini and Michelangelo, Contribution in structural system, e.g., ribbed dome, lantern dome, Baroque art & architecture and Rococo – Reformation in style, Revival of classical orders and principles - Neo-Classicism.</p> <p>America – Aztecs (1200 - 1521 CE) – City of Tenochtitlan, Incas (1438 - 1535 CE) Machu Picchu. West Asia: Ottoman Rule-(1281 - 1923 CE) - Works of Sinan, Mosques, Topkapi Palace and Grand Bazar. East Asia : Ming Dynasty (1420 - 1600 CE) – Forbidden City</p>

Recommended Reading:

1.	The Wonder that was India by A.L. Basham
2.	Spiro Kostof "History of Architecture"
3.	Global History of Architecture – Francis d.k Ching
4.	Indian Architecture – Percy Brown
5.	History of Architecture – Bannister Fletcher
6.	R.Nath, History of Mughal Architecture Vol-I,II,III. Abhinav pub. New Delhi
7.	Architecture in medieval India – Monica Juneja
8.	Satish Grover, Islamic Architecture in India

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BA18048S: Electives – IV (A) BARRIER FREE ARCHITECTURE
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18048S	Electives – IV (A) Barrier Free Architecture	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Understand that differently abled persons have disabilities and these should be taken into consideration when designing any structure. Every structure to be designed should incorporate all needs and parameters for normal as well as differently abled persons.

Detailed Syllabus:

1.	Understanding the concept of “Design for All” or “Universal Design”. Understanding principles of Universal design – Equitable use, Flexibility in use, simple intuitive, perceptible information, tolerance for error, low physical effort, size and shape for approach and use, etc. Understand goals for universal design – Body fit, comfort, awareness, understanding, wellness, social integration, personalization, cultural awareness, etc.
2.	Identify various applications of these principles and goals in designing spaces. Various examples of spaces/objects designed considering these principles. Introduction to various Design Standards, legislations, by international bodies and Indian context like National Building Code, etc.

Recommended Reading:

1.	ISO 21542: 2011 - Construction - Accessibility and Usability of the Built Environment
2.	ISO 20282-1:2006 [6] – Ease of operation of everyday products — Part 1: Context of use and user characteristics
3.	ISO/TS 20282-2:2013 [7] - Usability of consumer products and products for public use—Part 2: Summative test method
4.	India - Persons with Disabilities (Equal Opportunities, Protection of Rights & Full Participation) Act, 1995
5.	The Principles of Universal Design Version 2.0". Design.ncsu.edu. 1997-04-01. Retrieved 2014-12-14.
6.	"The Goals of Universal Design". Center for Inclusive Design and Environmental Access. April 10, 2012. Retrieved August 31, 2017.
7.	Ease of operation of everyday products -- Part 1: Design requirements for context of use and user characteristics Archived May 26, 2005, at the Wayback Machine

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BA18048S: Electives – IV (B) ART HISTORY
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18048S	Electives – IV (B) Art History	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Appreciate the qualities of a work of art which place it within the context in which it was produced. Develop the ability to formulate coherent responses to an image, to be able to express their ideas clearly and explain their response, understand the main features of the artistic periods covered.

Detailed Syllabus:

1.	To understand the expression of human beings in form of paintings. An overview of the pre-historic paintings and their styles. Developments in ancient civilizations.
2.	Developments in Renaissance, Baroque, Rococo and neoclassicism periods. "Isms" of painting. Modern Artists and their works.

Recommended Reading:

1.	A Short History of Art by Anthony Janson and H. W. Janson
2.	A History of Art History by Christopher Wood

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BA18048S: Electives – IV (C) ERGONOMICS
ANY ONE OF THE ELECTIVES (A), (B), or (C)

Course Information:

Sem.	Code	Course	L	St	Tot	Type	Cr	TM	CA 1	MSE	CA2	ESE-Pap	ESE-SV/STW
1	BA18048S	Electives – IV (C) Ergonomics	2	0	2	STW	2	100	20	0	20	0	60

Learning Objectives:

After successful completion of this course, student should be able to:
Understand the human body and study people's efficiency in their working environment.

Detailed Syllabus:

1.	Anthropometric the study of the characteristics of the human body. Ergonomics the application of anthropometric data to design, and proxemics the study of the effect of cultural/psychological factors on design environment and a user's culture, gender, stage of life cycle, and physical characteristics. Implemented in the design and construction of an object.
2.	Anatomy of hand, measurement, percentile data, Detailed study of, deviations and flexion of hands, types of grips in accordance with hand movements Study and ergonomic analysis of simple hand held products with respect to its Function, user, grips and dimensions. Redesigning a simple hand held product with supported ergonomic analysis

Recommended Reading:

1.	Ergonomics for Beginners: A Quick Reference Guide by Bernard Weerdmeester and Jan Dul
2.	Handbook of Human Factors and Ergonomics by Gavriel Salvendy
3.	Ergonomics in Design: Methods and Techniques (Human Factors and Ergonomics) by Marcelo M. Soares, Francisco Rebelo.