Amity School of Architecture & Planning (ASAP)

Bachelor of Architecture

Duration – 5 Years Full Time

A. Program Learning Outcomes

B. Program Structure – Batch 2018-23

C. Curriculum & Scheme of Examination
(Effective for 2018-23Batch)

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic and professional program with necessary skills to enable a student to excel in career.

This booklet contains the Program Structures, the Detailed Curriculum and the Scheme of Examination. The Program Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P) and Studio hours (ST). Towards earning credits in terms of contact hours, 1 Lecture as well as 1 Tutorial per week are rated as 1 credit each, 1 Studio hour is rated as 1 credit while 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-ST-P structure of 1-2-2 will have 5 credits, 1-2-0 will have 3 credits, and 2-0-0 will have 2 credits.

Lecture (L): Lecture is a one- way mode of transferring information/ concepts/ theory to students, usually delivered by an instructor. To check the understanding of concepts, frequent tests and quizzes are supplemented with lecture.

Tutorial (T): For completing class assignments, one -to-one practice sessions conducted by and with faculty member(s) are tutorials.

Studio(ST): Studios are peculiar to design & construction technology based courses where Content discourse, Training, Research, Project development, Project review, Concept generation, Peer Discussion and Final Solution/s are generated with one-to one interaction with Faculty as well as field experts in an iterative manner. Learning process also involves amalgamation of knowledge from various courses of the program as well are from other disciplines.

Practical (P): Practical are sessions where students are required to actually do (Hands-on) instead of writing/presenting ideas/thoughts and to demonstrate, practice or apply skills& knowledge using various mediums/resources individually or in groups.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are given below. Depending upon the course requirement, the weightage may slightly vary.

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test (Usually Mid Term)	CT	20
Term Paper	TP	10-15
Attendance	A	05
End Semester Examination	EE	50

The Bachelor of Architecture (B. Arch.) course is a professional course spanning duration of **FIVE** Years. The course is governed by the guidelines laid by the Council of Architecture modified as up to date. The course structure, scheme of examination and the syllabus was discussed and finalized in the Board of Studies meetings of the ASAP held on time to time to take the necessities of the changing times. The included Course structure was implemented 2018 batch intake onwards and post-facto presented in the 8th BOS Held on 05.12.2018 which was approved in 24th Academic Council held on 13.12.2018.

The course has an inbuilt component of training. This training component is spread over the entire duration of the course. Professional Internship for a period of ONE semester has been incorporated in 8th Semester (Stage-II) with the idea that the students could get best advantage of it while preparing the Dissertation and Final project in the 10th semester. The courses of studies have been revised in a manner that the students get best advantage of teaching & training in achieving the goals of profession. This shall also help the evaluators at ASAP to judge the impact of training on the academics.

There are many subjects that are taught right from the First Semester to the Seventh Semester and have varying credits. This continuity shows importance of the subject and the credits assigned reflect importance of the same. For example Architectural Design is the most important aspect of the B Arch Course. This subject has the maximum credits as well as the maximum teaching hours assigned to it with an idea that the students get exposure in handling problems of different complexities. The complexity is least in the first semester where basics and methodologies are introduced. In the coming semesters more and more difficult problems are introduced. The problems of the subsequent semester also involve the use of other subject studied by the student in the same or the previous semester. Similarly the subject Building material and construction shall be taught in a manner that first the simpler building materials shall be introduced to learn their properties and uses and then the processes of their application of using them in construction of spaces shall be introduced. The architectural design and building material and construction are the subjects that go hand in hand. The material one learned shall also be used in design and construction. These activities can be simultaneous as well.

Architectural design is the course that helps a student in generating imaginative, creative & logical solutions for identified problems related to built-environment. In the initial stages imagination is allowed with full freedom. In the initial semesters one could think of any shape which one could dream of and it could really be a fantasy. But with the increasing semesters and with increasing understanding of materials and construction processes the design shall be with limiting factors. The final design or the thesis project is the ultimate design where all aspects of design, construction and services including the impact of working in office of a professional shall be assessed. This shall show how professional project drawings are prepared and how its related report is prepared and submitted. The final project should be done in a way that anybody could understand the project, even in absence of the designer. The final is a kind of full dress rehearsal for joining the profession.

Structural Design and systems is a subject that lets the designer learn as to how he can see his design constructed. Initially the students shall be introduced the basic of the mathematical aspects of calculation of forces and the scientific procedures of giving shape to architectural design. This subject is really very important for ensuring if the fantasy of architectural design could be converted to reality or not. One

should remember that though there is nothing impossible as far as the engineering is concerned provided one is ready to bear the cost. Your imagination can be given a realistic shape. One needs only to assess and weigh the importance of cost to the design fantasy. As one advances in this subject, various design trends shall be introduces so that one could adopt advanced structural systems in ones design. This subject though is mathematical and little complicated, need be given due attention as it shall help the designer to be little realistic and economical as well.

Building Services is a subject without which none of the buildings could be functional. These services include the water supply, sanitary and waste management, electrical services, heating, ventilation and air-conditioning (HVAC) services, mechanical services such as lifts escalators etc. Today many advanced services are becoming essential to the buildings and their importance is increasing with the typology and importance of the building. These services would include the security systems, personal management systems and intelligent building management systems. Attempt shall be that the students are exposed to all possible available systems related to different types of buildings so that depending the type of the building they could be incorporated at the architectural design level.

History is very important to know our own roots. It also helps us to understand the development. 'Architecture is known as mother of all arts'. Once you learn the history of architecture you learn the developmental history of mankind besides other aspect. Realizing importance of the subject, teaching of history has been spread to different semesters. Attempt shall be made to make the student aware of the development of architecture around the world and in our own country to showcase as how we have been able to reach our present stage of development. Students shall learn the materials used in different period, technologies available and how grandeur could be achieved under different socio-economic and administrative conditions.

A large flexibility has been incorporated in the Course Structure through introduction of the CBCS and the student is allowed to select Choice Based Credits from within the School as well as from other schools of the University. If a student learns the same subject in consecutive five semesters he/she gets a Minor Track Certificate at the end of the studies.

AUR hopes that the students passing out of ASAP shall be fully equipped to face and handle independently the intricacies of architecture and shall efficiently and proficiently help in Nation Building.

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PROGRAMME LEARNING OUTCOMES (PLOs)

Following are the Programme Learning Outcomes of Bachelor of Architecture:

PLO 1: To develop critical and analytical approach in handling architecture designs of all types of buildings through demonstrating self-reflective process of conceptualizing and design thinking.

PLO 2: To create ability to identify social, economic, culturaland ecological issues and their impact on architectural design & apply theoretical knowledge gained from history, humanities & science to achieve sustainable architecture with emphasis on energy efficiency.

PLO 3: To Impart sound knowledge of building materials and their use in construction including structural systems.

PLO 4: To produce integrated architecture design solutions by incorporating appropriate building technologies and building services.

PLO 5: To build ability to understand ethical and professional responsibilities, comprehending realistic aspects of architectural practice, documenting & communicating effectively through graphical presentations while working in interdisciplinary groups.

AMITY SCHOOL OF ARCHITECTURE & PLANNING

Bachelor of Architecture

(05 Years / 10 Semesters)

2018-23 Batch

CREDIT SUMMARY

Semester	Core Course (CC)	Domain Electives (DE)	Value Added Course (VAC)	Open Electives (OE)	Non- Teaching Credit Courses (NTCC)	Total
I	25	0	4	0	0	**29**
II	21	0	4	3	1	**29**
III	21	2	4	3	0	**30**
IV	20	2	4	3	1	**30**
V	19	2	4	3	0	**28**
VI	19	2	4	3	1	**29**
VII	18	4	4	0	0	**26**
VIII	0	0	0	0	21	**21**
IX	22	4	0	0	0	**26**
X	18	6	0	0	0	**24**
Total	**183**	**22**	**28**	**15**	**24**	**272**

CC = Core Course

DE = Domain Elective

OE = Open Elective

VA = Value Added Course

NTCC = Non - Teaching Credit Courses (NTCC)

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AMITY SCHOOL OF ARCHITECTURE & PLANNING
Bachelor of Architecture
2018-23 Batch

Total Credits = 272

STAGE -I PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

FIRST SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 101	Design -I	CC	1	4	0	5	5
BAR 102	Materials & Construction Technology – I	CC	1	2	0	3	3
BAR 103	Structural Design & Systems – I	CC	1	1	0	2	2
BAR 104	Graphics Skills - I	CC	1	2	0	3	3
BAR 105	History of Built Environment	CC	1	1	0	2	2
BAR 106	Architectural Workshop	CC	1	2	0	3	3
BAR 107	Theory of Design	CC	1	1	0	2	2
BAR 108	Visual Arts & Appreciation	CC	0	2	0	2	2
BAR 109	Presentation Techniques	CC	1	2	0	3	3
BCS 101	English	VA	1	0	0	1	1
BSS 105	Behavioral Science – I (Understanding Self for Effectiveness)	VA	1	0	0	1	1
	Foreign Language - I	VA	2	0	0	2	2
FLT 101	French						
FLG 101	German						
FLS 101	Spanish						
FLC 101	Chinese						
	TOTAL		**12**	**17**	**0**	**29**	**29**
Note: Study tour to be conducted during semester. Marks to be added in even semester after evaluation							

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Bachelor of Architecture
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STAGE -I PROGRAM STRUCTURE

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Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

SECOND SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 201	Design – II	CC	1	4	0	5	5
BAR 202	Materials & Construction Technology – II	CC	1	2	0	3	3
BAR 203	Structural Design and Systems – II	CC	1	1	0	2	2
BAR 204	Graphics Skills – II	CC	1	2	0	3	3
BAR 205	History of Architecture – I	CC	1	1	0	2	2
BAR 206	Building Services – I	CC	1	1	0	2	2
BAR 207	Study Tour, NASA & other Academic/ Professional Activities-I	NTCC	0	0	0	1	0
EVS 001	Environment Science	CC	4	0	0	4	4
BCS 201	English	VA	1	0	0	1	1
BSS 205	Behavioral Science – II (Problem Solving & Creative Thinking)	VA	1	0	0	1	1
	Foreign Language - II	VA	2	0	0	2	2
FLT 201	French						
FLG 201	German						
FLS 201	Spanish						
FLC 201	Chinese						
	Open Elective/Minor Track	OE/MT	3	0	0	3	3
	TOTAL		**17**	**11**	**2**	**29**	**28**

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Bachelor of Architecture
2018-23 Batch

Total Credits = 272

STAGE -I PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

THIRD SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 301	Design – III	CC	1	5	0	6	6
BAR 302	Materials & Construction Technology – III	CC	1	2	0	3	3
BAR 303	Structural Design and Systems – III	CC	1	1	0	2	2
BAR 304	Graphics Skills – III	CC	1	2	0	3	3
BAR 305	History of Architecture – II	CC	1	1	0	2	2
BAR 306	Building Services - II	CC	1	1	0	2	2
BAR 307	Surveying & Leveling	CC	1	2	0	3	3
Domain Elective – I (Select any One DE)			1	1	0	2	2
BAR 308	Photography	DE					
BAR 309	Vernacular Architecture	DE					
BAR 310	Model Making Workshop	DE					
BCS 301	Communication Skills – I	VA	1	0	0	1	1
BSS 305	Behavioral Science – III (Interpersonal Communication)	VA	1	0	0	1	1
	Foreign Language - III	VA	2	0	0	2	2
FLT 301	French						
FLG 301	German						
FLS 301	Spanish						
FLC 301	Chinese						
	Open Elective/Minor Track	OE/MT	3	0	0	3	3
	TOTAL		**15**	**15**	**0**	**30**	**30**
Note: Study tour to be conducted during semester . Marks to be added in even semester after evaluation							

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Bachelor of Architecture
2018-23 Batch

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STAGE -I PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

FOURTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 401	Design – IV	CC	1	5	0	6	6
BAR 402	Materials & Construction Technology – IV	CC	1	2	0	3	3
BAR 403	Structural Design & Systems – IV	CC	1	1	0	2	2
BAR 404	Graphics Skills – IV	CC	1	2	0	3	3
BAR 405	History of Architecture – III	CC	1	1	0	2	2
BAR 406	Building Services – III	CC	1	1	0	2	2
BAR 407	Study Tour, NASA & other Academic/ Professional Activities-I	NTCC	0	0	0	1	0
BAR 408	Architectural Climatology	CC	1	1	0	2	2
Domain Elective – II (Select any One DE)			1	1	0	2	2
BAR 409	Bamboo Architecture	DE					
BAR 410	Architecture Documentation	DE					
BAR 411	Barrier Free Architecture	DE					
BCS 401	Communication Skills – II	VA	1	0	0	1	1
BSS 405	Behavioral Science – IV (Relationship Management)	VA	1	0	0	1	1
	Foreign Language - IV	VA	2	0	0	2	2
FLT 401	French	VA					
FLG 401	German	VA					
FLS 401	Spanish	VA					
FLC 401	Chinese	VA					
	Open Elective/Minor Track	OE/MT	3	0	0	3	3
	TOTAL		**15**	**14**	**0**	**30**	**29**

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AMITY SCHOOL OF ARCHITECTURE & PLANNING
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Total Credits = 272

STAGE -I PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

FIFTH SEMESTER

Course Code	Course Title	Category	L/ T/ ST /P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 501	Design –V	CC	2	5	0	7	7
BAR 502	Materials & Construction Technology – V	CC	1	2	0	3	3
BAR 503	Structural Design & Systems – V	CC	1	1	0	2	2
BAR 504	Graphics Skills – V (Computer Aided)	CC	1	2	0	3	3
BAR 505	Building Bye - Laws & Codes Practices	CC	1	1	0	2	2
BAR 506	Building Services – IV	CC	1	1	0	2	2
Domain Elective – III (Select any One DE)							0
BAR 507	Building Appreciation	DE	1	1	0	2	2
BAR 508	Energy Conservation Architecture	DE					
BAR 509	Digital Architecture	DE					
BCS 501	Communication Skills – III	VA	1	0	0	1	1
BSS 505	Behavioral Science – V (Group Dynamics and Team Building)	VA	1	0	0	1	1
	Foreign Language – V	VA	2	0	0	2	2
FLT 501	French						
FLG 501	German						
FLS 501	Spanish						
FLC 501	Chinese						
	Open Elective/Minor Track	OE/MT	3	0	0	3	3
	TOTAL		**15**	**13**	**0**	**28**	**28**
Note: Study tour to be conducted during semester . Marks to be added in even semester after evaluation							

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STAGE -I PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

SIXTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 601	Design – VI	CC	2	5	0	7	7
BAR 602	Materials & Construction Technology – VI	CC	1	2	0	3	3
BAR 603	Structural Design & Systems – VI	CC	1	1	0	2	2
BAR 604	Quantity Surveying & Specification	CC	1	1	0	2	2
BAR 605	Landscape Design & Site Planning	CC	1	2	0	3	3
BAR 606	Building Services - V	CC	1	1	0	2	2
BAR 607	Study Tour, NASA & other Academic/ Professional Activities-I	NTCC	0	0	0	1	0
Domain Elective – IV (Select any One DE)							
BAR 608	Intelligent Buildings	DE	1	1	0	2	2
BAR 609	Vaastu in Architecture	DE					
BAR 610	Architecture Pedagogy	DE					
BCS 601	Communication Skills – VI	VA	1	0	0	1	1
BSS 605	Behavioral Science – VI (Stress and Coping Strategies	VA	1	0	0	1	1
	Foreign Language -VI	VA	2	0	0	2	2
FLT 601	French						
FLG 601	German						
FLS 601	Spanish						
FLC 601	Chinese						
	Open Elective/Minor Track	OE/MT	3	0	0	3	3
	TOTAL		**15**	**13**	**0**	**29**	**28**

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Bachelor of Architecture
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STAGE -II PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

SEVENTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 701	Design – VII	CC	2	8	0	10	10
BAR 702	Materials & Construction Technology – VII	CC	1	2	0	3	3
BAR 703	Construction & Project Management	CC	1	1	0	2	2
BAR704	Housing &Town Planning	CC	1	2	0	3	3
Domain Elective – V (Select any One DE)							
BAR 705	Architectural Conservation	DE	1	1	0	2	2
BAR 706	Modular Construction Technology	DE					
BAR 707	Colors	DE					
Domain Elective – VI (Select any One DE)							
BAR 708	Bioclimatic Architecture	DE	1	1	0	2	2
BAR 709	Professional Presentation Techniques	DE					
BAR 710	Design of Logo &Signages	DE					
BCS 701	Communication Skills – VII	VA	1	0	0	1	1
BSS 705	Behavioral Science – VII (Individual, Society & Nation)	VA	1	0	0	1	1
	Foreign Language -VII	VA	2	0	0	2	2
FLT 701	French						
FLG 701	German						
FLS 701	Spanish						
FLC 701	Chinese						
	TOTAL		**11**	**15**	**0**	**26**	**26**

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Bachelor of Architecture
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STAGE -II PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

EIGHTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 801	Practical Training	NTCC	0	0	0	**21**	0

NINTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 901	Design – VIII	CC	2	11	0	13	13
BAR 902	Advance Materials & Construction Technology	CC	1	2	0	3	3
BAR 903	Dissertation	CC	2	4	0	6	6
Domain Elective – VII (Select any One DE)							
BAR 904	Light and Architecture	DE	1	1	0	2	2
BAR 905	Intelligent Interiors	DE					
BAR 906	Disaster Resistant Architecture	DE					
Domain Elective – VIII (Select any One DE)							
BAR 907	Tensile Construction	DE	1	1	0	2	2
BAR 908	Interior Design	DE					
BAR 909	Set Design	DE					
	TOTAL		**7**	**19**	**0**	**26**	**26**

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STAGE -II PROGRAM STRUCTURE

Note:- Lecture (L) - 1 Hr. = 1 Credit
Studio (ST) - 1 Hr. = 1 Credit
Practical (P) - 2 Hrs. = 1 Credit

TENTH SEMESTER

Course Code	Course Title	Category	L/T/ST/P Per Week			Credits	Teaching hours
			L	T/ST	P		
BAR 1001	Architectural Thesis Project	CC	6	10	0	16	16
BAR 1002	Professional Practice & Management	CC	1	1	0	2	2
Domain Elective – IX (Select any One DE)							
BAR 1003	Product Design	DE	1	1	0	2	2
BAR 1004	Cost Effective Architecture	DE					
BAR 1005	Geographical Information System	DE					
Domain Elective – X (Select any One DE)							
BAR 1006	Architectural Journalism	DE	1	1	0	2	2
BAR 1007	Building Economics & Legislation	DE					
BAR 1008	Building Information Management	DE					
Domain Elective – XI (Select any One DE)							
BAR 1009	Environmental Impact Assessment	DE	1	1	0	2	2
BAR 1010	Prefabrication	DE					
BAR 1011	Virtual Architecture	DE					
	TOTAL		**10**	**14**	0	**24**	**24**

Note: Students completing Stage-I can be awarded Bachelors of Building Science Degree but B.Arch Degree will be awarded after completion of Stage-I & Stage-II. Stage -I and Stage -II must be completed in 8 years as per COA.

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BAR 101 DESIGN – I

Course Code: BAR 101 **Credit Units: 05** L/1-ST/4-P/0 **Teaching hours: 05**

Course Objectives:

- To create visual compositions using elements and principles in theory of design and understand its application in built-environment
- To measure, draw and comprehend relationship between human dimensions and those of built-environment.
- To investigate forms and subsequently analyze existing built-forms and spaces through Measured drawings so as to derive design criteria from the Case Studies
- To create architecture design for single purpose space employing the architectural design process
- To practice direct application of learning in BAR107 Theory of Design

Course Contents:

Module I: Design of2D & 3D Compositions - 2 weeks

Exercise to design compositions with 2D Shapes and 3D Forms (geometric and irregular) using elements and principles of design

Module II: Transformations and Form Analysis– 3 weeks

Transformations of Forms -Addition, Subtraction, Extrusion – Space division, Space derivation, positive and negative spaces , Form Analysis, 2d representation of 3d form in terms of plan, section and elevation, Application in built- environment such as Façade design, Door elevation, Carpet design; Floor tile design & floor design, Mural design etc.

Module III: Anthropometrics - 2 weeks

Human dimensions – static and dynamic; proportions, space dimensions for various human postures and activities; Modular and Golden Section

Module IV: Measured Drawings of Architectural Spaces – 2 weeks

Importance of Case Study in design learning, Study of various existing architectural spaces through preparation of measured drawing with furniture layout

Module V: Design and Representation of Single purpose space unit – 5 weeks

Design project of Single Space unit structure with respect to Visual Language of Form (Art), Functional Space, Material & Structure (Technology) and culture; Suggestive Studio Projects involving activity spaces such as Living area, sleeping area, washroom, cooking area etc. – for example, cabin design, Entrance gate, kiosk, Toilets, Kitchen, Study room, Exhibition stall etc.

An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 102 MATERIALS AND CONSTRUCTION TECHNOLOGY - I

Course Code: BAR 102 Credit Units: 03 L/1-ST/2-P/0Teaching hours: 03

Course Objective:

- To understand the use of traditional building materials in simple building works.
- To familiarize students with basic building components, their function and behavior under various conditions with specific reference to "Load Bearing Construction"

Course Contents:

Module I: Building Materials and Construction Technology - 3 weeks

Introduction to components of building from foundation to roof: Foundation, plinth, plinth beam, damp proof course (D. P.C.), sill, lintel, beam and slab, parapet, mumty etc. Detailed Section through 2 story building, Introduction to various methods, technology, materials, tools and equipment commonly used in – Excavation, Masonry works and carpentry.

Module II: Clay and Clay products, Stone - 2 weeks

Mud including stabilized earth, burnt bricks, brick tiles, blocks, lime and its product, stone and its varieties etc,

Classification, availability, preparation and uses of above materials and their structural, visual and textural properties.

Module III: Brick and Stone Masonry -3 weeks

Terminology: Bricks and its types, bats and closures used in different Brick Bonds

Bonding: Types of bonds: English, Single, double, Flemish and rat trap bond.

Corbelling, String courses and decorative brickwork.

Stone masonry: Types of stones, dressing and different bonds in stone, Random Rubble, Coursed Rubble, Ashlar.

Module IV: Stone and brick masonry Foundation - 3 weeks

Foundations: Need for foundations, its preliminary design criteria.

Detail of spread foundation for load bearing walls of various thicknesses.

Module V: Openings - 2 weeks

Openings – Types and construction details of Lintels, arches, sill, jam etc. necessary to make openings

Exercises: preparation of drawings on above topics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building construction W.B.McKay
- Building construction R Berry
- Building construction Chudley
- Building construction Francis D.K. Ching.

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BAR 103 STRUCTURAL DESIGN & SYSTEM- I

Course Code: BAR 103Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objective:

- To introduce the structural system in a building with all the basic components to understand the functions of various elements and building technologies used in various types of buildings.

Course Contents:

Module I: Simple Stresses and Strains- 3 Weeks

Elasticity, Stress, Strain, Types of Stresses, Elastic limit, Hook's Law,,Modulus of Elasticity, Stresses in Composite Bars. , Poison's ratio, shear stress, Basic, Deformation of a body due to self-weight & force acting on it.

Module II:Principal stresses and strains-3 Weeks

Introduction, principal planes & their stresses, Analytical methods for the stresses on an oblique section of a body, stresses on an oblique section of a body subjected to a direct stress in one plane & two mutually perpendicular directions.

Module III:Centre of gravity-2 Weeks

Introduction, Centroid, methods for Centre of gravity, Centre of gravity by geometrical & moments consideration, axis of reference, Centre of gravity of plane figures, symmetrical & unsymmetrical sections.

Module IV:Moment of inertia-2 Weeks

Definition, Important theorems, section Modulus, Calculation of M.I by Integration method and its application to architecture system

Module V:Elements of Static-2 Weeks

Law of parallelogram of forces, resolution of a forces, law of triangular of forces, polygon of forces, Theorem of resolved parts resultant of number of concurrent coplanar forces, conditions of equilibrium, moment of a forces. Moment and arm of a couple, theorems on couples

Module VI:Shear force and bending moment-2 Weeks

Various types of support & loads in Beams, Calculation of reactions in loaded beams, Cantilever & simply supported, Point load ,udl&uvl. Calculation of shear force & bending moment & also its diagrammatic representation.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Elements of Structure, Morgan
- Salvadori, Structures in Architecture,
- Everet, Structure and Fabric,
- Khurmi R. S., Strength of Materials,
- R.K. Bansal, Engineering Mechanics
- Khurmi R. S, Applied Mechanics and Strength of Materials.
- Salvadori and Heller, Structure in Architecture.

BAR 104 GRAPHIC SKILLS – I

Course Code: BAR 104 Credit Units: 03 L-1/ST-2/ P-0Teaching hours: 03

Course Objective:

To familiarize the students with various drawing tools to give basic knowledge of drafting and lettering techniques. To provide a clear understanding about the scale of measurement and orthographic projections used as drawing technique.

Course Contents:

Module I: Introduction to basics drafting, Lettering & Scales

Introduction and setting to the drawing equipment, Concept of line, its types, Line thickness quality, grade, divisions and angles, Concept of polygons, circles, geometrical curves, helix etc., Concept of Dimensioning & dimension line, BIS codes of drawings.

Free hand and Architectural lettering, proportion of letter size as per scale and size of the sheet.Scales: Engineers scale, Graphical scale and Representation factor (R.F).Scales on drawings. Types of scales: Plain scale and Diagonal scale.

Module II: Projection- Point, Lines, Planes

Definition, meaning and concept, Principles and Methods of projection.Projection of point, Lines & planes.

Module III: Projection-Solid

Projections of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions.Sections of regular rectilinear and circular solids in varying conditions of sectional plane.

Module IV: Surface Development

Introduction and Methods of development of surfaces.Development of lateral surfaces of right solids like Cubes, Prisms, Cylinders, Pyramid, Cone etc.

Module V: 3D Drawing Views

Types, uses & advantage. Isometric, Axonometric & oblique view -solids, compositions&buildings.Metric drawings, projections and their dimensions.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Architectural Graphics, C. Leslie Martin
- Architectural Graphics, Ching Frank
- Engineering Drawing, N.D. Bhatt

References:

- A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather Architectural Graphic standards editor, Boaz Joseph
- Neufert's Architect's data
- Time Saver standards for building types, Editor Joseph D.C. and John Callender. Rendering with pen and ink
- Practical Plane and Solid Geometry, H.Joseph and Morris

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BAR 105 HISTORY OF BUILT ENVIRONMENT

Course Code: BAR 501Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

- To make them understand the importance of study history of Architecture, development of civilizations and evolution of design as a by process of it
- To familiarize students with the factors influence the development of architecture in the history. Such as socio-economic, historical political influences of that time.
- To inform them about the technologies, materials used in the historical developments and their impact on the present day knowledge of architecture and design.
- To familiarize them the regional architecture.

Course Contents:

Module I: Introduction to History of Human Settlements and Its Importance - 2 weeks

Pre-Historic Period till 3000B.C. - The type of settlement development during the period taking few examples of the different periods – Neolithic, Mesolithic, Bronze age, Iron Age with advancements of construction techniques, material used , human progression over the time period.

Module II: Introduction to Valley Civilization-1 - 4 weeks

Nile Valley Civilization (3000 B.C. – 100 A.D.)- Introduction to Egyptian Architecture and civilization, building characteristics and developments over the period in respect of different styles, construction technology, building materials used, evolution of form with significant changes over the time period.

Examples like- Tomb Architecture- Mastabas, Pyramids, Temples at Giza , Thebes ,Karnak Etc.

Mesopotamian Civilization (2500 B.C. – 600 B.C.)- Mesopotamian Civilization comprising of Babylonian, Assyrian, Akkadian Sumerian civilization in respect of buildings styles, construction technology, building materials used, evolution of form and art work development with significant changes over the time period

Examples like - Forts ,Temples ,Dwellings ,Ziggurats at Uruk ,Ashur ,Babylon etc.

Module III: Introduction to Valley Civilization-2 - 4 weeks

Indus Valley Civilization (3300B.C. – 300 B.C.)- The era of development in the Indus valley. Development of Harappan civilization. Iron Age of India explaining with examples of planning and buildings, construction technology, building materials used, evolution of form and art work development with significant changes over the time period.

Vedic Architecture (1750 B.C.)- The Aryan civilization- explain with examples of the buildings, construction technology, building materials used, evolution of form and art work development with significant changes over the time period.

Module IV: Introduction to Rajasthani Civilization - 4 weeks

Introduction to Regional Architecture of Rajasthan- Māru-Gurjara Architecture and Rajputanadesign from different regions with examples of Jaipur City and nearby areas:
Forts & Palaces – AmerFort,City Palace , Nahargarh Fort, Udaipur Palace, Kumbhalgarh Fort , Mehrangarh fort etc.
Havelis – in Shekhawati like at Nawalgarh , Fatehpur , Ramgarh ,Mandawa etc.
Stepwells& Temples – Chand Baori at Abhaneri , Ranakpur Temple , Dilwara Temple ,Rani Sati Temple ,Eklingji Temple Etc.

Introduction to Planning of Old Jaipur City with characteristics and material significance according to climate . Study the examples of vernacular buildings like HawaMahal , City Palace, Albert Hall , JantarMantar etc. with developing the understanding of different elements like jharokhas , jalis , chhatrisetc.locally available materials , their application ,construction techniques, evolution of form and characteristics changed over time period

Detailed Presentation exercise to be combined with local educational tour, heritage walks to be organized at regular intervals during the semester comprising of analysis of existing structures with respect

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Sir Bannister Fletcher, (1975) "The History of Architecture"
- G.K.Hiraskar (2018)"Great Ages of World Architecture"
- YatinPandya, (2005) "Concepts of space in Traditional Indian Architecture"
- DeependraPrashad, SaswatiChetia, (2007)"New Architecture and Urbanism: Development of Indian Traditions"
- VibhutiChakrabarti,(1998) "Indian Architectural Theory and Practice: Contemporary Uses of VastuVidya"

BAR106ARCHITECTURAL WORKSHOP

Course Code: BAR 106 **Credit Units: 03** L/1-T/2-P/0**Teaching hours: 03**

Course Objectives:

To introduce various building materials like carpentry, materials testing methods within the site and Working methods of Architectural components like Arches, Dome and Vaults etc.

Course Contents:

Module I: Introduction to carpentry - 4 weeks

Introduction to the carpentry tools, processes, joints and wood working machines. Preparation of various carpentry joints, fixing of plywood, commercial boards etc. and their application in furniture. Painting and polishing on different surfaces and textures

Module II: Introduction to Building materials - 6 weeks

Building materials Manufacturing process, on site quality tests of types of bricks, cement, lime, sand, aggregate. Types and uses of mortar and concrete. Superstructure: Types of bonds, ends and junctions, attached and detached piers, jointing and pointing in brick masonry and stone masonry.

Module III: Building Components and construction - 4 weeks

Types of arches in bricks and stone, centering of arches. Types of Dome, Construction method of Dome, Assembling of Glass curtain wall.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Cassells Carpentry and Joinery by Paul N. Hasluck
- The Very Efficient Carpenter: Basic Framing for Residential Construction Paperback by Larry Haun
- Complete Book of Framing: An Illustrated Guide for Residential Construction 2nd Edition by Scot Simpson
- The Basics of Building with Arches, Vaults and Cupolas by Thierry Joffroy
- Building of the Arch Enlarged 9th Edition by R. Artaega
- Brunelleschi's Dome: How a Renaissance Genius Reinvented Architecture by Ross King
- Illustrated Dome Building by Gene Hopster
- Dome Builder's Handbook No. 2 by William Yarnall
- Building Materials by S.K. Duggal
- Building Material and Construction (WBSCTE) by S.S. Bhavikatti

Online Resources

- http://www.gobrick.com/docs/default-source/read-research-documents/technicalnotes/30-bonds-and-patterns-in-brickwork.pdf?sfvrsn=0
- https://civilengineering.blog/2017/10/27/types-of-bonds-in-brick-masonry/

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BAR 107 THEORY OF DESIGN

Course Code: BAR 107 Credit Units: 02 L/1-ST/1-P/0 Teaching Hours : 02

Course Objectives:

- To enable student to develop understanding of "Design" as problem solving process for everyday life
- To enable student to interpret "Architecture Design" as integration of Visual Form, Functional space, Human measure, building technology (material and structural systems), economy, culture and environment.
- To enable student for direct application of design theories in studio projects of course BAR101 Design –I

Course Contents:

Module I: Design and Built Environments - 2 weeks

Introduction to Design – Creative problem solving, Aspects of Design – Art and Science, Design for Built Environment, Role of Architect, Interior Designer& Engineer, Aspects of Architecture Design– Visual Language of Form(Art) , Functional Space, Material & Structure (Technology) and culture.

Suggested Activities:i) *Student will be asked to use online and Library resources to select images of any one product from everyday life and images of any one building of his/her choice to investigate aspects of design embedded in them. Student will present the investigation and learning in the form of PowerPoint presentation. ii) Group reading and discussion from extracts of "A Pattern Language: Towns, Buildings, Construction – Christopher Alexander"*

Module II: Visual Language – 4 weeks

Introduction to how we see forms and perceive them and its importance in design, Visual Elements of Design - **point, line, surface, solids, colour, texture**etc; Principles of Design-**Balance, Symmetry, Repetition, Rhythm, Datum, Hierarchy** etc.; Built Forms and their aesthetics, Order-Character- meaning (symbolism) of Built Forms, Abstraction

Suggested Activities:*i) Student will be asked to do online search for optical illusions and present them in class to appreciate how we perceive things ii) Student will be asked to disintegrate/explode a given built form into its constituent elements by sequential representation in drawing from whole form to surfaces to lines till points.iii) Student will be asked to sketch any one Building Façade in vicinity to identify and disintegrate it into its constituent design elements. Student needs to present the identified design principle that binds the elements together in the selected building façade iv) Students will be asked to search for built-forms that with strong association in cultural meaning and present them*

Module III: Function: Activities, Spaces and Anthropometrics – 4 weeks

Types of Built- Environment - Enclosures; Human activities- space function; Types of Spaces – Primary, Supporting (Ancillary) and Link; Positive and Negative spaces; Relationship between Built-Form and Space & its function; Elements of Space making ; Anthropometrics – Human being as measure of everything, Modular and Golden Section.

Suggested Activities:*i)In Group:- Rectangles of different sizes shall be marked in an open area and students shall be asked to use anthropometrics to suggest activities that can be done in the marked area. Students will enact the suggested activities within the area to evaluate their comprehension of space and anthropometrics ii) In Group : Students will be asked to create enclosure around the marked area and comprehend the psychological difference w.r.t space which the sense of enclosure creates in the user. Students shall now be asked to re-suggest the activities within the enclosure and enact them to evaluate their comprehension of space and anthropometrics iii) Composition using Golden Section*

Module IV: Technology and Design - 2 weeks

Role of Material and technology in Design for Built- Environments; Brief introduction to types of Structural systems and their influence on built form; key materials used in Building Design (interior and exterior); Relationship between Material, Structure, function and form.

Suggested Activities:*i) Student will be assigned a building/ built-form to deduce the influence of material and structure system on built-form ii) Redesign of a given built-form by altering material and structural system to presented through conceptual sketch/ model*

Module V: Design Process in Architecture– 2 weeks

Iterative problem solving process of Design (Design Cycle); Design Process for Built-forms – sequence and stages; Different drawing types to represent different Design Stages – Bubble Diagram, Space Matrix, Conceptual Drawing, Architectural Presentation Drawing and Working Drawing.

Suggested Activities:*i) Student will draw Design Process cycle, Bubble Diagram, Space Matrix, conceptual drawing and Presentation drawing for Studio Project in the course BAR101Design-I*

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- A Pattern Language: Towns, Buildings, Construction- Christopher Alexander
- Structure in Architecture, Heller Robert and Salvadori Mario
- Design Fundamental in Architecture, Walter Gropius
- Pattern of Nature, Peter Streens
- Elements of Architecture, MeissPieree Von
- Architecture: Form, Space and Order, Francis D.K. Ching
- Elements of Space Making – YatinPandya
- Sketch Book by Tony Hunt
- Letter to Young Architects- Christopher Benninger

BAR 108 VISUAL ART AND APPRECIATION

Course Code: BAR 108Credit Units: 02 L/0-ST/2-P/0**Teaching hours: 02**

Course Objectives:

- To familiarize the students with the fundamentals and vocabulary of design.
- To expose the students to the practice of arts appreciation
- To enable the students, represent their ideas in different media through aesthetically pleasing compositions.

Course Contents:

Module I: Principles of design- 2 weeks

Introduce the students to the fundamental elements of art -line, shapes, form, space, colour, value & texture. Exercises willinvolve application of these elements.

Impart conceptual and procedural knowledge about principles of design- Balance, unity, pattern, emphasis, movement,rhythm,and contrast. Exercises will require implementation of these principles

Module II: Fundamentals of Colours- 3 weeks

Introduce the students to the fundamental terminologies of colour - hue, intensity,value, shades, tints, warm &cool colours– Learning their synthesis and application through exercises.

Enable the students to comprehend the qualities of colours –Colour wheel - Primary, Secondary &Complementary colours.Learning their synthesis and application through exercises.

Module III: Various Mediums of Drawings -3 weeks

Familiarize the students with the different mediums of drawing- Pencils, ink and water colour. Exercises will include creation of simple art works using the various mediums

Module IV: Free hand drawing - 2 weeks

Upskill the students with techniques of free hand drawing.Exercises will involve drawing of still life objects and outdoor sketches like buildings, streets, etc.

Module V: Art Appreciation - 2 weeks

Expose the students to the practice of interpretation of visual representation like ideas, emotions, and activities. Demonstrate examples to students. Exercises will include synthesis of graphics art with a background expression.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Wayne Enstice, Melody Peters, "Drawing space, Form, Expression",Prentice hall, Englewood Cliffs, New Jersy, 1990.
  Palmer John, "Drawing & Sketching", Brock Hampton Press,London,1993.
- "Learn to Paint and Draw", Victoria House Publishing Ltd., Bath, UK, 1981.
  Goodman Sue & Porter Tom., "Designer Primer", Butter Worth Architecture,London, 1988.

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 109 PRESENTATION TECHNIQUES

Course Code: BAR 108 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objectives:

- To familiarize the students with the fundamentals and vocabulary of design.
- To expose the students to the practice of arts appreciation
- To enable the students, represent their ideas in different media through aesthetically pleasing compositions.

Course Contents:

Module I: Principles of design- 2 weeks

Introduce the students to the fundamental elements of art -line, shapes, form, space, colour, value & texture. Exercises willing valve application of these elements.

- Impart conceptual and procedural knowledge about principles of design- Balance, unity, pattern, emphasis, movement, rhythm, and contrast. Exercises will require implementation of these principles

Module II: Fundamentals of Colours- 3 weeks

Introduce the students to the fundamental terminologies of colour - hue, intensity, value, shades, tints, warm &cool colors– Learning their synthesis and application through exercises. Enable the students to comprehend the qualities of colours –Colour wheel - Primary, Secondary &Complementary colours. Learning their synthesis and application through exercises.

Module III: Various Mediums of Drawings -3 weeks

Familiarize the students with the different mediums of drawing- Pencils, ink and water colour. Exercises will include creation of simple art works using the various mediums.

Module IV: Free hand drawing - 2 weeks

Up skill the students with techniques of free hand drawing. Exercises will involve drawing of still life objects and outdoor sketches like buildings, streets, etc.

Module V: Art Appreciation - 2 weeks

Expose the students to the practice of interpretation of visual representation like ideas, emotions, and activities. Demonstrate examples to students. Exercises will include synthesis of graphics art with a background expression.

Examination Scheme:

Components	A	CE	CT	EE
Weight age (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Architectural Graphics, C. Leslie Martin
- Architectural Graphics, Francis D.K. Ching
- Rendering with Pen & Ink: Robert W. Gill
- The Color Source Book for Graphic Designers: SadaoNakamiva
- Time Saver standards for building types, Editor Joseph D.C. and John Callender
- Neufert's Architect's Data
- Architectural model making by Nick Dunn
- Architectural Model Building by Roark T. Congdon

BAR 201 DESIGN – II

Course Code: BAR 201 **Credit Units: 05** L/1-ST/4-P/0 **Teaching hours: 05**

Course Objectives:

- To understand interdependence of Form, Function, structure and basic services in building design
- To comprehend Site as determinant of Architectural Design
- To progress from the ability to design for uni-funtional space to multi-functional spaces in a single building not exceeding G+1

Course Contents:

Module I: Introduction

Introduction to interdependence of Form, Function, Structure and essential services in with examples of residential buildings not exceeding G+1; Establishing Relationships between multifunctional spaces and their disposition in a single building; Understanding Site and Conducting Site Studies; Project introduction for studio exercise

Module II Measured Drawing as Tool for Case Studies and Site Studies

Detailed Measured Drawings (Plans, Sections & Elevations) of Residential building along with Site measurements and studies; Literature Review – Design Standards and Codes, Brief Formulation

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, efficiency of design to be worked out and finalized.

Module V: Presentation

Enhancement of presentation skills using multiple media. Creation of 3-D models based on the design. Preparation of perspective views (internal & external). Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include minor problems like bus shelter, milk booth, entrance gate, watchman's cabin, traffic police kiosk, flower stall, ATM Centre and major problems like Residence – villa, farmhouse, weekend cottage, artist studio etc. having 3-4 spaces.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources/resources**-landing-page

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BAR 202 MATERIALS AND CONSTRUCTION TECHNOLOGY - II

Course Code: BAR 102 Credit Units: 03 L/1-ST/2-P/0Teaching hours: 03

Course Objective:

- To acquaint the students with Timber as a construction material and to familiarize them with construction techniques for use in building works.

Course Contents:

Module I: Timber -2 weeks

Difference between wood and timber, Classification, Characteristics, Defects and Preservation.

Module II: Timber Doors --3 weeks

Drawings of Timber Joinery, Types, Classification and Usage.

Doors: Ledged, Braced, Battered door, flush, paneled, single and double shutter doors of various types and sizes.

Module III: Timber Windows and ventilators - 3 weeks

Types, classification and construction details

Fully glazed, fixed glass, timber louvered, bay & casement window detail, ventilators details.

Module IV: Different type of Timber products: -3 weeks

Soft board, hard board, ply, straw board, MDF board, saw dust, block and particle board etc.

Their manufacturing, advantages and disadvantages, market terminology, Sizes available and prices, availability and use with all the details. Report, samples, catalogs to be compiled from market survey.

Module V: Wooden Staircases & trusses- Basic concepts and construction -2 weeks

Different type of Staircases & trusses and their terminology and construction detail.

Exercises: Preparation of drawings on above topics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building construction W.B.McKay
- Building construction R Berry
- Building construction Chudley
- Building construction Francis D.K. Ching

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BAR 203 STRUCTURAL DESIGN & SYSTEM - II

Course Code: BAR 203Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objective:

- To understand the application of basic structural system into modified system of structure.
- To help the students for understand the basic principles of structural behavior and requirements of buildings with emphasis laid on the principles of various load & stresses distribution in beams and columns.

Course Contents:

Module I:Stresses in Beams-3 weeks

Theory of simple bending- neutral layer, bending stresses in beams, bending equation, Definitions, Distribution of shear stress in section of a beam – rectangular, semi- circular, T and I sections.

Module II:Analysis of Trusses-2 weeks

Introduction, forces in members, analytical methods, Method of joint & sections, graphical method, link polygon in trusses

Module III:Direct and Bending stresses-2 weeks

Introduction, eccentric loading, columns with eccentric loading, symmetrical columns with eccentric loading about one & two axis.

Module IV:Deflection of Beams-3 weeks

Introduction, Curvature of the bending beam, relation between slope, deflection & radius of curvature, methods for slope & deflection at a section, simply supported beam with a central, eccentric, UDL, UVL, Macaulay's method for slope & deflection.

Module V:Columns & Struts-3 weeks

Definition, Euler's Theory of long columns, Assumptions in the Euler's column theory Columns with end conditions, slenderness ratio, Limitations of Euler's formulae, IS Codes for columns.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Elements of Structure, Morgan
- Salvadori, Structures in Architecture,
- Everet, Structure and Fabric,
- Khurmi R. S., Strength of Materials,
- R.K. Bansal, Engineering Mechanics By.
- Khurmi R. S, Applied Mechanics and Strength of Materials,
- Salvadori and Heller, Structure in Architecture,

BAR 204 GRAPHIC SKILLS – II

Course Code: BAR 204Credit Units: 03L/1 ST/2 P/0Teaching hours: 03

Course Objective:

To enable students to produce manual drawings of interpenetration of solids, perspective views and Sciography. To impart the techniques of architectural rendering required for effective presentation.

Course Contents:

Module I: Interpenetration of Solids

Orthographic Projection Drawings and Axonometric views of interpenetration of different solids in different position.

Module II: Introduction to perspective – Plan Method

Importance and use of perspective drawing in architecture; Anatomy of a perspective-cone of vision, station Points, picture plane, eye level, horizon line, ground line, vanishing point, etc; One point & Two point Perspectives Plan Method-simple form to building forms.

Module III: Perspective – Grid Method

One Point and Two point perspectives using Grid Method for faster production of Perspective Drawings.

Module IV: Sciography

Values in shades and shadows. Constructing plan shadows (point, line and plane), Constructing shadows in elevations (Point, line and Plane). Constructing shadows in perspective views. Short- cut methods for constructing shadows.

Module V: Introduction to Rendering(dry and wet)

Presentation techniques in different types, medium and materials. Rendering perspectives in different media (Dry/water based color and ink etc.). Variation in color/ ink, as per light position.Use of basic plantation, vehicles, human beings etc to introduce scale to building perspectives.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Architectural Graphics, C. Leslie Martin
- Perspective and Sciography, Shankar Mulik
- Interior Design, Ahmed Kasu
- Architectural Graphics, Ching Frank
- Engineering Drawing, N.D. Bhatt
- Engineering Drawing – P.S. Gill

References:

- A.J. Metric Handbook, editors, Jan Bilwa and Leslie Fair weather
- Architectural Graphic standards editor, Boaz Joseph
- Neufert's Architect's data
- Time Saver standards for building types, Editor Joseph D.C. and John Callender.
- Rendering with pen and ink.

BAR 205 HISTORY OF ARCHITECTURE-I

Course Code: BAR 205 Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

- Understanding of the Art and architecture of an era with respect to its influence in terms of its location, climate as well as the socio-cultural historical, economical and political systems in planning, building form and architectural details.
- Study of the building types and development of major buildings form of that period in detail with examples that identify the works of the period.

Course Contents:

Module I: Module titleBuddhist and Architecture- 2 weeks

Buddhist Architecture- study of Bodh Gaya and SanchiStupa, Examples of Chaityas, Monastries and Stupas

Module II: Temple Architecture- 2 Weeks

- South India or Dravidian Architecture – Pallava Style (AD 600-900), Chola Style (AD 900-1150), Pandya Style (AD 1200 -1350), Vijaynagara Style. Some of the major buildings to be covered include Ratha and Shore temples in Mahabalipuram, Brihadeshwara Temple in Tanjore, Meenakshi Temple in Madurai and VirupakshaTemple
- NorthIndia
  Nagara Style of Gwalior explained using examples of TeliKaMandir, Chaturbhuja Temple, etc.
  Nagara Style of Orissa with examples of Mukteshwara Temple, Lingaraja Temple, Konark Sun Temple, etc.
  KhajurahoGroup of temples
- Central India - Chalukyan/ Vesara Style of Architecture – Description using examples like Badami Temple, temples at Aihole,etc.
- Jain temples of Rajasthan andGujarat

Module III:Introduction to Islamic Period-1 Week

Introduction and understanding of "Islam's" philosophy and its interpretation in building types – Mosque, Tomb, Fort and their elements like dome, arches, minarets etc. With reference to the Slave, Khilji, Tughlaq, Lodi and ShershahSuri (who ruled from Delhi), architecture at Punjab, Gujrat, Bijapuranddeccan.

Module IV:Mughal Architecture-2 Weeks

Examples of monuments at FatehpurSikri, Qutab Complex, Tuglakabad, TajMahal, GolGumbaj, Golconda Fort, Jami Masjid etc.The Architecture related to Babur, Humanyu, Akbar, Shahajan Period and later Mughal period its implication on Architectural field. Introduction to Mughal Gardens

Module V :Indian Colonial architecture-1 Week

Monumental buildings of Early colonial period – Examples – St.Pauls Cathedral Calcatta& Bombay Town hall –Architectural character of Indo-Saracenic and Classical revival –University of Madras Senate House & Victoria Memorial hall Calcutta – Later Colonial period – Contribution of Edwin Lutyens& Herbert Baker to the lay-out and Architecture of New Delhi – RashtrapathiBhavan&ParliamentHouse.

Measured drawing exercise may be combined with local educational tour, recommended by the subject teacher to be organized at the end of the semester after the examinations

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- "Glimpses of World History" by Pt. JawaharLal Nehru
- "The History of Architecture" by Sir Bannister Fletcher

  Satish Grover
  - *Indian Architecture (Islamic Period) – Percy Brown*
  - *Indian Architecture – Islamic Period – 1192 – 1857 D Dr. SurinderBahai*
  - *Islamic Architecture of the Indian Subcontinent – Bianca MariaAlferia*
- "Buddist and Hindu Architecture" in Indiaby

References:

- History of Architecture – J ESwain
- History of Architecture by DoraCouch
- A study of History – AlmondToynbee
- Traditions in Architecture – DoraCouch
- Indian Architecture (Islamic Period) – PercyBrown

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 206 BUILDING SERVICES -I

Course Code: BAR 206 Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

- To acquaint students to basic principles of water supply, sanitation and plumbing bye laws and systems.
- To assist them in design of plumbing systems at building to town level for different typologies.

Course Contents:

Module I: Water Supply- 2 weeks

Introduction to water supply- sources of water; impurities, purification and treatment of water, Need to protect water; and requirements of water supply for different building types- storage, distribution.

Water supply systems at City/ Settlement level; Distribution networks; schematic making of an overhead water reservoir for a town/city.

Module II: Drainage Systems- 3 weeks

Concept, design and detailing of drainage systems at micro and macro level- Introduction to municipal drainage systems at town level, Building/ Site planning for drainage systems, Rainfall, Storm water drains, gullies, open drains (construction, gradients, ventilation and maintenance etc.). Concept, design and detailing of rainwater harvesting systems. Self-cleansing velocity, invert levels, drains on sloping sites, sewage disposal system in unsewered localities- septic tank, soak pits, cesspools, aqua-privy, leeching pits for individual building of urban and rural areas.

Module III: Sanitation- Sewerage- 2 weeks

Purpose and principles, collection and conveyance of waste matter. Sewage treatment plants and bye products.Sewage system design at building and town level.Sanitary appliances, fixture, traps, pipes and joints, drainage in non-municipal areas.Plumbing bye laws. Plumbing design of a toilet and kitchen

Module IV: Sanitation- Solid waste management - 2 weeks

Garbage types, collection and disposal- Purpose and methods (Incinerator, Dry disposal etc.). Garbage disposal in multi-story buildings, Treatment of industrial refuse, Refuse and pollution problems.R4 of waste management.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Water supply, waste disposal and environmental engineering, ChatterjeeWater supply and sanitary engineering, Singh
- Water supply and sanitation, Shah
- S.C.Rangwala,"Water supply and sanitary engineering", Chartar publishing house, Anand,1989.

References:

- Design and practical handbook of plumbing, Mohan &Anand Plumbing Design and practice, Deolalikar
- Civil handbook, Khanna
- Building construction details, Banz
- Maintenance of buildings,Panchdhari
- G.M. Fair, J.C. Geyer and D.Okun, "Water and Waste water engineering", Volume II, JohnWiley& Sons, Inc. New York, 1968
- Manual on sewerage and sewerage treatment, CPHEEO – Ministry of works and housing, NewDelhi, 1980
- Renewable energy, basics and technology, supplement volume on integrated energysystems, Auroville, 1998

BAR 207 STUDY TOUR /NASA / EXTRA CURRICULAR ACTIVITY-I (Evaluation)

Course Code: BAR 207 **Credit Units: 01** **Teaching hours: NIL**

Guidelines:

- Students shall visit different parts of Rjasthan.
- The report shall be evaluated and marks shall be added in even semester, for study tour.
- It shall be related to the studies done in history of architecture, art & culture and Architecture Design of current & pervious semester.
- Student will be marked for work done for national / Zonal convention of NASA (National Association of student of architecture) & any other activity related to NASA.
- Participation of every student will be compulsory in activities related to NASA though every student may not be attending the same. Report will be submitted for evaluation of NASA work.
- Marking will be done for work done for NASA, in current & pervious semester.
- Evaluation for all extracurricular activities will be done in this course (for current & pervious semester).

The Layout Guidelines for the Report

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm
- The report can be hand written as well
- The report shall be properly bound and submitted individually.

Assessment Scheme:

Continuous Evaluation:	50% (Based on punctuality, regularity of work.)
Final Evaluation:	50% (Based on the Documentation in the file/ presentation/ viva)

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BAR 301 DESIGN – III

Course Code: BAR 301Credit Units: 06 L/1-ST/5-P/0 Teaching hours: 06

Course Objectives:

- To understand design for low rise Community buildings requiring integration of multifunctional spaces and services
- To understand symbolisms in built-forms

Course Contents:

Module I: Introduction

Introduction to community buildings preferably not exceeding G+2 that need ease of access, vertical circulation, way finding and form that can be a landmark and symbolize the aspirations of the target group with examples; Project introduction for studio exercise

Module II :Case studies, Site Studies and Literature Studies

Case Studies – primary and secondary; Site studies; Literature Review – Design Standards and Codes, Comparative Analysis and Area statement

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, efficiency of design to be worked out and finalized.

Module V: Presentation

Enhancement of presentation skills using multiple media. Creation of 3-D models based on the design. Preparation of perspective views (internal & external). Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include community buildings like Kindergarten School, Primary Health Centre, neighbourhood Cafeteria, Motel, Post Office, Bank extension counter, Police Station, Departmental Store, Gymkhana and Youth Club etc.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR 302 MATERIALS & CONSTRUCTION TECHNOLOGY – III

Course Code: BAR 302 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

- To acquaint the students with cement and cement concrete as a construction materials and to familiarize them with construction techniques in building works.

Course Contents:

Module I: Introduction to cement and Concrete – 2 weeks

Cement types, qualities, precautions etc. special purpose cement, cement concrete: Types, Mixing, Curing, Water Cement Ratio etc.

Reinforced Brick Concrete: Qualities and Workability.

Introduction to R.C.C, its usage, types, making and availability with its advantages and disadvantages.

Concreting under special conditions.

Module II: Foundation – 3 weeks

shallow and deep foundation

R.C.C. footings, isolated, strip, combined footings, Raft, Pile foundation with their detail.

Module III: Staircases – 3 weeks

Different types of R.C.C. Staircases with their construction detail, Components of staircase.

Module IV: Special Details – 3 weeks

R.C.C. columns and beam structure, roof forms and its connection with structure.

R.C.C. work defects and its treatment.

Expansion joints and its detail.

R.C.C. roof with water proofing details.

Module V: Temporary constructions – 3 weeks

Shoring, underpinning, strutting, formwork, scaffolding etc. in timber and steel.

Exercises: Identification of materials and study of relevant I.S. codes, field trips, preparation of drawings on above topics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building construction W.B.McKay
- Building construction R Berry
- Building construction Chudley
- Building construction Francis D.K. Ching Civil Engineering Handbook, P.N. Khanna
- R.C.C. Design, Khurmi, Punmia, Sushil Kumar Design of Steel Structure, Negi
- Structure in Architecture, Salvadori and Heller.

BAR 303 STRUCTURAL DESIGN & SYSTEM- III

Course Code: BAR 303 Credit Units: 02 L/1-ST/1-P/0Teaching hours: 02

Course Objective:

- To understand the transformation of basic components of structural system into the analysis of structural system like: - analytical approaches in the beams & columns by using different kind of methods.
- To help the students for understanding the analytical methods by using statically methods which is described below

Course Contents:

Module I: Forms of structure-3 weeks

Determinacy & indeterminacy of the rigid as well as pin jointed structures, definition of static & kinematic indeterminacy, its application in plane & space forms structures.

Module II: Shear Force & Bending Moments calculation & its diagrammatic presentation by Moment distribution method-3 weeks

Introduction of S.F.D & B.M.D. calculation of shear force & bending moment by using moment distribution method for all types of support & loading system.

Module III:Shear Force & Bending Moments calculation & its diagrammatic presentation by Slope deflection methods-2 weeks

Introduction of S.F.D & B.M.D. calculation of shear force & bending moment by slope deflection methods for all types of support & loading system.

Module IV: Shear Force & Bending Moments calculation & its diagrammatic presentation by strain energy methods-2 weeks

Introduction of S.F.D & B.M.D. calculation of shear force & bending moment by Strain energy method for all types of support & loading system.

Module V: Arches-2 weeks

Introduction, definition, three & two hinged arches, fixed arches. Parabolic & circular arches.& its application in architecture system.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- E. P. Popov, Mechanics of materials.
- S. Ramanathan, Theory of Structures.
- S. Bhavikatti, Structural analysis Vol.-I.
- S. Bhavikatti, Structural analysis Vol.-II.
- Morgan, Elements of Structure.
- Salvadori, Structures in Architecture.
- Everet, Structure and Fabric.
- Khurmi R. S., Strength of Materials
- R.K. Bansal, Engineering Mechanics.
- Khurmi R. S, Applied Mechanics and Strength of Materials.
- Salvadori and Heller, Structure in Architecture.

BAR 304 GRAPHIC SKILLS– III (Computer aided)

Course Code: BAR 304 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

- To introduce students with computer and its application in architecture.
- To train students in drafting and presentation techniques using Auto-CAD.
- To train students how to make 2-D presentation and render using photoshop.

Course Contents:

Module I: Intro to Computer Graphics and basic application of 2D drafting Software - 1 week

Introduction to Auto CAD and its interface.Auto CAD co-ordinate system, inputting points, basic Auto CAD terminology, basic drafting commands.

Module II: Auto Cad (2-D): basic commands and introduction to use of printing equipment's and hardware -2 weeks

To setting up a drawing environment; setting up the paper size setting unit setting grid limit, drawing limit, snap controls. Two-dimensional drafting work to be handled in detail on Auto Cad. Basic Drafting commands (Related to drafting of line to All geometrical shapes).

Module III: Auto Cad (2-D): modifying commands - 3 weeks

Basic commands related to drawing properties "layer control change properties, line-weight control". Use of Display Commands, editing commands, construction commands, enquiry commands etc., Hatching & texting in drawing, Working on layout & x-ref etc. Drafting of Plan(s), Elevation(s) and Section(s).

Module IV: Auto Cad (2-D): advanced commands-3 weeks

Draw, edit and create a complete set of architectural drawings for a dwelling unit using AutoCAD Plan(s), Elevation(s) and Section(s) in detail. Create final presentation and documentation of 2D drawings in AutoCAD.

Familiarizing the use of printers, plotters their hardware and other related systems.Various Settings & different mode to print Auto CAD drawing. Importing & exporting the drawings from one software into other.

Module V: Use of photo editing Software - 4 weeks

Introduction to Photo editing as well as preparation of 2-D presentations and rendering views on Photoshop.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Manuals of AutoCAD – Autodesk Inc.
- Computer graphics and design, Radhakrishnan Inside AutoCAD -parker, denial& rice
- Adobe Photoshop user guide/manual.
- Manuals of AutoCAD – Autodesk Inc.

BAR 305 HISTORY OF ARCHITECTURE- II

Course Code: BAR 305 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

Understanding the world architecture during the Greek, Roman Romanesque Period and Gothic Period, Study of specific Architectural examples, characteristics features and their origin in above mentioned period.

Course Contents:

Module I: Greek Architecture- 2 weeks

Evolution and Development, Classical orders and constituent elements of architecture- Column orders and the articulation of temples.Classification of temples, Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site. Study of importance- Acropolis, Agora, Temples, Theatres, Tombs and House forms

Module II:Roman Architecture- 2 Weeks

Evolution and Development, Multiple building types to correspond the complex social functions and structure. Complex axial organization of forms.Concrete and construction of vaults and domes.Uses of classical orders in surface articulation. Study of important forums, Temples, Basilicas, Theaters, Amphitheatres, Circuses, Tombs, Triumphal arches, palaces, houses and villas.

Module III: Early Christian Architecture- 1 Week

Introduction and understanding of "Islam's" philosophy and its interpretation in building types – Mosque, Tomb, Fort and their elements like dome, arches, minarets etc. With reference to the Slave, Khilji, Tughlaq, Lodi and ShershahSuri (who ruled from Delhi), architecture at Punjab, Gujrat, Bijapuranddeccan.

Module IV:Byzantine Architecture-2 Weeks

Study of Italian basilicas and churches.Centralization in churches, Centrality and interiors of both cross domed and cross in square plan churches. Interior and exterior of churches with heavenly interiors.Construction of domes over polygonal compartments through the use of pendentives.Study of important churches of the Time period.

Module V :Romanesque Architecture-1 Week

Spatial and formal integration of Romanesque churches.Integration of wall and vaults.Ribbed vault and the dissolution of external wall to allow light.Sensitivity to light and use of stained glass for mysterious interiors.Need and development of different external buttressing. Study of important cathedrals and churches in France

Presentations, paper writing and Essays exercise may be optionally be considered, recommended by the subject teacher at the end of the semester after the examinations

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- "Glimpses of World History" by Pt. JawaharLalNehru
- "Ubrban Pattern" by A.B.Gallion
- "The History of Architecture" by Sir BannisterFletcher
- "The great age of world Architecture"-G.K Hirasker

References:

- History of Architecture – J ESwain
- History of Architecture by DoraCouch
- A study of History – AlmondToynbee
- Traditions in Architecture – DoraCouch

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BAR 306 BUILDING SERVICES- II

Course Code: BAR 306 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

- To integrate electrical system with building design. Application of indoor and outdoor lighting in various planning and installation requirement right from generation to actual building level so that the students could use the same in their design.

Course Contents:

Module I: Introduction to electrical systems- 1 weeks

Introduction to electrical engineering services for buildings; Sources of electrical energy supplied to buildings
Electricity generation, transmission and distribution. Instruments for measurement, metering; Electricity Authority, Act, rules and regulation regarding electrification of buildings; Standard Graphical symbols for electrical systems; electric fittings and appliances; Requirements of electrical materials such as conductors, insulators; Types and requirements of electrical cables

Module II: Electrical System design for a building - 1 weeks

Basic Principles of electrical circuit, Methods of wiring -Open and concealed wiring system, distribution system and supply in a building, distribution board and meter, switches; Electrical load calculation,; Design considerations of electrical installations, Study of Electrical layout in a building.

Module III: Electrical safety and protection system - 1 weeks

Protection against overload, short circuit, Control equipment such as switch gear, safety devices to be used in electrical layouts - Fuse, M.C.B, MCCB, ACB, VCB, RCB, ELCB; Earthling and Lightening Protection

Module IV: Photometric Concepts and Day Lighting- 1 weeks

Introduction to basic photometric concept: Light its behaviour and properties, Instruments for measurement lux meters, field of vision, visual task, visual comfort and glare: objectives of lighting design in architecture.

Module V: Artificial Lighting- 1 weeks

Introduction to basic photometric concept: Light its behaviour and properties, Instruments for measurement lux meters, field of vision, visual task, visual comfort and glare: objectives of lighting design in architecture.

Module VI: Design Exercise- 2 weeks

Design and developed detailed layout of electrical and lighting services of previous semester design problem.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Raina K. B. & Bhattacharya S. K. (2007) Electrical Design, Estimating and Costing, New Age International Publishers, New Delhi.
- Dagostino, F. R. (1978) Mechanical and Electrical Systems in Construction in Architecture, Reston Publishing Company, Prentice Hill Co., Virgenia.
- Egan, D. M. (1983) Concepts in Architectural Lighting, McGraw Hill Book Company.
- Flynn, J. E. et. al (1992) Architectural Interior Systems: Lighting, Acoustics and Air conditioning, Van Nostrand Reinhold
- NBO (1966) Hand book for Building Engineers, National Buildings Organisation, New Delhi.
- Grondzik, W. T., Kwok, A.G., Stein, B, Reynolds, J. S. (2009) Mechanical and Electrical Equipment for Buildings, Wiley
- "Electric Heating",E.P. Ambrose,John Wiley & Sons Inc., New York, 1968.
- Electrical Technology, Seventh Edition,H. Cotton,CBS publications, 2003
- Design of Electrical Installations by Er. V.K. Jain and Er. Amitabh Bajaj

BAR 307 SURVEYING AND LEVELLING

Course Code: BAR 307 Credit Units: 03 L/1-T/2-P/0**Teaching hours: 03**

Course Objective:

- To impart basic surveying &levelling principles and use the skills to commonly needed in the planning of projects.
- To Demonstrate the role and application of modern surveying techniques and technologies.

Course Contents:

Module I:Introduction to surveying-2 weeks

Role of surveying in Architecture, Principle of surveying, classification of surveying according to nature of field & object, units of measurements.

Module II: Linear measurement-3 weeks

Role of linear measurement, Different methods, Equipment- Tape, chain, Odometer, Arrows, Ranging rods, Stadia Tachometry, EDM, Procedure, errors, applications of linear measurement

Module III:Angular measurement-3 weeks

Various equipment's, theodolite, compass -surveyors & prismatic, simple numerical. Rectangular and polar coordinates, Definition of Traverse, Application of traversing, Equipment and field procedure.

Module IV:Leveling & Contouring-3 weeks

Definition, Levelling instruments, differential levelling, Booking and reduction, Longitudinal and cross sectioning, Contouring, Characteristics of contours, locating contours.

Module V:Plane tabling & Setting out works-2 weeks

Various equipment's, methods of plane table, & setting out works, triangulation method etc. Simple methods of preparing on site drawings and layout of small buildings

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Alok De, plane Surveying
- W. Schofield and Butterworth, Engineering surveying
- B.C. Punmia,Heinemann Surveying vol- 1
- S.K. Duggal, Surveying vol -1

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 308 PHOTOGRAPHY

Course Code: BAR 308 Credit Units: 01 L/1-ST/1-P/0**Teaching hours: 02**

Course Objectives:

- This course will teach students to create successful images of exterior architecture, interior architectural design, as well as architectural models.
- The course discusses equipment, processes, and procedures necessary for the photography of building exteriors and interiors, dusk/night and night architectural landscapes, and construction progress.
- Students will learn to use Digital SLR camera, lighting techniques, software and to create output.
- Students will be able to use High Dynamic Range (HDR) : multiple exposures to create dramatic architecture/interior images without additional professional lighting.

Course Contents:

Module I: Introduction - 2 weeks

Architectural Photography Origins of architectural photograph, Review of architectural photographs, Light and Shades, Understanding light – Properties and elements of light. Basics of camera – Operations and Control Parallax Error, use of camera, lens and understanding lighting conditions. Pixels, resolution, Sensor size etc.

Module II: Light & Planning – 4 weeks

Understanding light and photography, External lighting- Direction of lighting - front, side, back, shadows, texture, and effects of clouds, light modification, psychological effects, and types of artificial lighting, combined daylight and flash.Overview of architectural photography, Color balance, Reading histogram, White balance and Color temperature.

Module III: Creativity in Photo shooting - 4 weeks

Shooting Finding Forms and Shapes, Elements and Principals of framing, Rules of composition, Aesthetic of framing and composition, Perceptual Control, Depth of field and center of confusion, Exterior and interior photography, Flash control etc.

Module IV: Quality & Safety Management - 4 weeks

Introduction to software, RAW file editing, HDR Imaging, Adobe Photoshop and Light room, Retouching and color correction, Printing Preparation Module IV: Framing Views Single point and two point perspective- examples, distortions, emphasizing architectural elements, effect of camera to subject distance, oblique angles, three point perspective- applications in interiors and exteriors - composition, symmetric composition, applying the law of thirds - examples, image capture to publication

Project: Students should submit two projects at the end of the semester. (a) Interior Photography (b) Exterior Photography .

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Ackerman, J. S. (2001). On the origins of architectural photography. Mellon lecture, December
- Harris, M. G., & Harris, M. G. (1998). Professional architectural photography. Oxford: Focal Press
- Rosa, J., & McCoy, E. (1994). A constructed view: The architectural photography of julius Shulman, Rizzoli Intl Pubns.
- Siskin, J. (2012). Photographing architecture: lighting, composition, postproduction, and marketing techniques. Buffalo, NY: Amherst Media
- Schulz A., Architectural Photography: Composition, Capture, and Digital Image Processing, O'Reilly Media Inc., 2010

Online Resources

- https://www.udemy.com/topic/architecturephotography

BAR 309VERNACULAR ARCHITECTURE

Course Code: BAR 309 Credit Units: 02L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

To expose the students to traditional architecture of the various parts of the country. Thestudents will have knowledge of the planning aspects, materials used in construction, constructional details and settlement planning of the settlements in various parts of the country.

Course Contents:

Module I:**Introduction to Vernacular Architecture**

Approaches and concepts to the study of Vernacular architecture – Introduction to Kutcha architecture and Pucca architecture and architecture without architects developed through experience based on local material.

Module II:**Southern region**

Planning aspects, materials of construction, Constructional details & Settlement Planning of:

- Kerala – Nair houses (Tarawads), Kerala Muslim houses (Mappilah houses), Temples, Palaces and theaters – Thattchushastra.
- Tamil Nadu – Toda Huts, Chettinad Houses (Chettiars) & Palaces
- Karnataka – Gutthu houses (land owning community), Kodava ancestral home (Aynmane)
- Andhra Pradesh –Kaccha buildings Religious practices, beliefs, culture & climatic factors influencing the planning of the above.

Module III:**Western Region:**

Planning aspects, Materials used, Constructional details, Climatic factors influencing the planning of

- Jat houses for farming caste, Bhungas(Circular Huts) and Havelis(Pukka houses) of Rajasthan
- Pol houses of Ahmedabad - Primitive forms, Symbolism, Colour, Folk art etc in the architecture of the deserts of Kutch & Gujarat state.
- Vernacular architecture of Goa.

Module IV: Northern and Eastern India

Planning aspects, Materials used, Constructional details, Climatic factors influencing the planning of

- Kashmir – Typical Kutcha houses, mosque, Dhoongas(Boathouses), Ladakhi houses, bridges
- Himachal Pradesh – Kinnaur houses
- Uttar Pradesh – Domestic housing of Uttar Pradesh

- Bengal – Bangla (Rural house form), AatChala houses – change from Bangla to Bungalow, Kutcha&Pucca architecture of Bengal.Nagaland – Naga houses & Naga village, Khasi houses Factors influencing the planning aspects, materials of construction& constructional details of the above.

Module V :Vernacular Architecture

Overview of vernacular Architecture of neighbouring countries and world such as Africa, UAE etc.

Exercise : Students may be advised to prepare case studies through literature/online/ site visits and submitreport.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Traditional buildings of India, Ilay Cooper, Thames and Hudson Ltd., London
- Architecture of the Indian desert, Kulbushan Jain &Meenakshi Jain, Aadi Centre, Ahmedabad
- The Royal Palaces of India, George Michell, Thames and Hudson Ltd., London
- Chettiar Heritage, S.Muthiah, MeenakshiMeyappan, Visalakshmi RAMASWAMY, Lokavani-Hallmark Press Pvt. Ltd., Chennai
- Encyclopaedia of Vernacular architecture of the World, Cambridge University Press
- Havali – Wooden houses & mansions of Gujarat, V.S.Pramar, Mapin Publishing Pvt. Ltd., Ahmedabad
- The Tradition of Indian architecture – Continuity & Controversy – Change since 1850, G.H.R.Tillotsum, Oxford University Press, Delhi
- VISTARA – The architecture of India, Carmen Kagal. Pub : The Festival of India, 1986.
- House, Form & Culture, Amos Rappoport, Prentice Hall Inc, 1969

BAR310 MODEL MAKING WORKSHOP

Course Code: BAR 310 Credit Units: 02L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

To introduce various fabrication skill and techniques to produce scale –models and to encourage preparation of models as an essential phase in design development and evaluation.

Course Contents:

Module I: Introduction to model-making - 4 weeks

Need, role of scale models in design, general practices, Essentials of model-making, understanding of various tools And machines employed, best practices involved in operating the tools and the techniques.

Module I: Materials for model-making - 4 weeks

Introduction of various materials available for model making such as papers, mount boards, mount sheets, wood, plastics, films, plaster of Paris, acrylic sheets, metal, glass, FRP etc. Potential of these materials, in model-making

Module III: Techniques of scale-modeling- 6 weeks

Use of different scale, templates, measuring aids, conventions followed. Techniques for preparation of presentation models, mock-ups, simulation of various materials and textures such as wood, glass, aluminum, steel, bricks, roofing tiles, flooring, etc. Models with soft materials like; clay, plaster of Paris etc. Models of shells & membrane structures by use of canvas molding cloth

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Architectural Models: Construction Techniques – Wolfgang Knoll, Martin Hechinge
- Model-Making: Materials and Methods – David Neat

Reference Books

- The aesthetic experience –magnet Jacque Form, Space & Order – D.K Ching.
- Object by Architects – tapert,Annette,swidpowell Art Forms – Preble,duame

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 401 DESIGN – IV

Course Code: BAR 401Credit Units: 06 L/1-ST/5-P/0 Teaching hours: 06

Course Objectives:

- To understand design for multifunctional public/commercial buildings upto G+6 requiring parking, vertical circulation, Grid Planning

Course Contents:

Module I: Introduction

Introduction to public or commercial buildings up to G+6 that are governed by Site restrictions in terms of bylaws and need ease of access, vertical circulation, way finding, Grid Planning and parking with examples; Project introduction for studio exercise

Module II :Case studies, Site Studies and Literature Studies

Case Studies – primary and secondary; Site studies- vehicular circulation pattern studies; Literature Review – Design Standards and Codes, Comparative Analysis and Area statement

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and 3-D sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, efficiency of design to be worked out and finalized.

Module V: Presentation

Enhancement of presentation skills using multiple media. Creation of 3-D models based on the design. Preparation of perspective views (internal & external). Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include office buildings, shopping centers/mall, Library, Town Hall,/municipal offices//headquarters, District Court, Nursing Homes, etc.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR 402 MATERIALS & CONSTRUCTION TECHNOLOGY – IV

Course Code: BAR 402 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective

- To familiarize students with different metals such as aluminum and steel and copper in construction techniques for use of building materials in building works.

Course Contents:

Module I: Steel -2 Weeks

Study of steel as building material: types/ properties and treatment and various uses.

Structural, Visual and textural properties, Varieties and application of steel and other metals and alloys

Module II: Foundation columns& trusses - 2 Weeks

Foundation such as Grillage foundation.

Structural Steel columns and space frames, Different type and details of Structural steel trusses, details of geodesic domes etc.

Roofing: Roof covering in G.I. Asbestos and fiber Sheets etc.

Module III: Staircases - 3 Weeks

Metal staircase: Types and construction detail and joints, fire escape staircase.

Module IV:Steel door and windows - 3 Weeks

Steel door and window: types and construction detail, standard door/ windows sections, fire doors Types of Rolling Shutters and their construction detail.

Module V: Aluminum - 3 Weeks

Aluminum as building material: properties and treatment, Construction and fixing details used for aluminum doors and windows, their applications, types, pricing.

Market survey of available materials: technology and hardware.

Exercises: presentation of seminars, preparation of drawings on above topics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building construction W.B.McKay Building construction R Berry
- Building construction Chudley
- Building construction Francis D.K. Ching

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BAR 403 STRUCTURAL DESIGN & SYSTEM- IV

Course Code: BAR 403Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objective:

- To understand the material specification &its physical, engineering properties.
- To help the students for understanding the mix design process by IS codes & laboratory experiments & also learn about the soil classification & foundation system in framed as well as load bearing structures.

Course Contents:

Module I:Cement-3 weeks

Definition, Ingredients, Compounds, Properties, Hydration, Types and applications, manufacturing process of cement. Workability & durability Tests of cement

Module II:Aggregate-3 weeks

Classification, Sp. Gravity, Bulk density, moisture contents, Bulking of fine aggregates, fineness modulus, Practical size distribution. Laboratory tests for aggregate particles.

Module III:Concrete & its mix design-3 weeks

Definition, Advantages/ disadvantages, relevant IS codes, workability, Compressive strength, Flexural strength, factors affecting strength, nominal and designed mix concrete. Laboratory & field tests to check the quality of concrete in terms of workability & durability.

Module IV:Soil Mechanics & Foundation engineering-4 weeks

Importance of the subject, Types of Soils, Phases, various Index properties of soil, relationships, simple numerical Classification of soil, engineering properties of soil, testing of soil. Various types of foundations, Bearing capacity of soil, field tests, plate load & penetration test, Effect of water level, Failure of foundation systems, Design procedures for simple load bearing foundations.,Terzaghi's theory

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- M.V. Naik, Building Construction – Materials.
- Khurmi R. S, Strength of Materials.
- Khurmi R. S., Applied Mechanics and Strength of Materials.
- P.N. Khanna, Civil Engineering Handbook.
- M.S. Shetty, Concrete technology.
- K.R. Arora, Soil mechanics & foundation engineering.
- Morgan, Elements of Structure.
- Salvadori, Structures in Architecture.
- Mackay WB, Building Construction, Vol. 1-4.
- Chudley, Construction Technology, Vol. 1-6.
- Mitchell, Elementary Building Construction.
- Everet, Structure and Fabric.

BAR 404 GRAPHICS SKILLS – IV (Computer Aided)

Course Code: BAR 404Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

To learn drawing 3D-drawings through computers and taking advantage of it for rendering and presentations of the views.

Course Contents:

Module I: Introduction to (3-D) software: Exterior and Interior – 2 weeks

Introduction to basic 3-D software of architectural significance AutoCAD-3D and their basic usage (creating conceptual exterior and views of an Architectural Project).

Creating detailed Interior and views of a 3D project using Auto CAD.

Module II: Introduction to (3-D) software: Exterior and Interior -3 weeks

Introduction to basic 3-D software of architectural significance Google SketchUp and their basic usage (creating conceptual exterior and views of an Architectural Project).

Creating detailed Interior and views of a 3D project using Google SketchUp.

Module III: Introduction to Rendering software: Exterior-3 weeks

Use of V-Ray for Rendering 3D models of SketchUp and their final editing in photoshop.

Module IV: Introduction to Rendering software: Interior-3 weeks

Use of V-Ray for Rendering 3D models of SketchUp and their final editing in photoshop.

Module V: Introduction to Animation-3 weeks

Creating animation (walkthrough) of 3D models on SketchUp.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Manuals of AutoCAD – Autodesk Inc.
- Computer graphics and design, Radhakrishnan Inside AutoCAD- parker, denial& rice
- Google SketchUp user's guide.
- Adobe Photoshop user guide/manual.
- Google SketchUp for Interior Designers – Daniel John Stine
- Rendering in SketchUp – Daniel Tal V-ray user's Guide.
- Lumion user's guide/manual.
- Architectural Design with SketchUp – Alexander Schreyer

BAR 405 HISTORY OF ARCHITECTURE

Course Code: BAR 405 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

Understanding the world architecture during the, Renaissance and Baroque Period; Study of specific Architectural characteristics and their origin in above-mentioned period.

Understanding the Modern and contemporary Architectural History From 19th Century to the present age, the development process, the change in Techniques and construction.

Course Contents:

Module I: Gothic Architecture- 2 weeks

Massiveness and verticality of medieval churches.Combination of towered structures and longitudinal basilica.Gradual integration of towers from early to later with examples.Integration of centralized and longitudinal plans.Articulation of external wall like arcaded interiors resulting in dematerialization of exterior.Study of important cathedrals and churches from Italy and France.

Module II:Renaissance Architecture- 2 Weeks

- Italian Renaissance - The idea of rebirth and revival of art - Outline of the Architecture during the early Renaissance, High Renaissance and Baroque Periods - Features of a typical Renaissance palace, eg. Palazzo Ricardi, Study of the contribution of the following architects: Brunelleschi, Michaelangelo, Andrea Palladio, Example - St. Peter Rome,VillacaprainVicenza.
- High Renaissance Architecture-French and English Renaissance- architectural character in the classical & Rococo period - Example – Chateau de Chambord, Louvre,Paris –Domestic British architecture- Study of the works Sir Christopher Wren,&Inigo Jones, Example - St. Paul's Cathedral, London. Banqueting House, Whitehall..

Module III: Baroque Architecture and Neo-Classical Period -1 Week

Dynamism and systemization of Baroque architecture vitality and spatial richness with underlying systematic organization.Definition of Neo-classic with taking few examples of the period. Study the buildings and structures relation to form, ratio, symmetry etc. Study of the different areas inFrance.

Module IV:Industrial revolution and modern Architecture movements (19th and 20th Century)-2 Weeks

Reasons for the evolution of Modern Architecture, origins-Neo Classicism-Enlightenment, Social revolutions, Historiography, Revivalism-Works of Soane,Ledoux, BouleeDurrand&Schninkel. Industrial revolution and its impact – Emergence of new building typologies-New Materials and Technologies : history of steel ,glass and concrete.Arts& Crafts movement in Europe and America; Art nouveau, and the works of Horta, Guimard, Gaudi and Macintosh; Organic Architecture -Early works of F.L.Wright.Chicago school; Art deco Architecture in Europe and America.

Presentations, paper writing and Essays exercise may be optionally be considered, recommended by the subject teacher at the end of the semester after the examinations

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- "Glimpses of World History" by Pt. JawaharLalNehru
- "Ubrban Pattern" by A.B.Gallion
- "The History of Architecture" by Sir BannisterFletcher
- "The great age of world Architecture"-G.K Hirasker

References:

- History of Architecture – J ESwain
- History of Architecture by DoraCouch
- A study of History – AlmondToynbee

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- Traditions in Architecture – DoraCouch

BAR 406 BUILDING SERVICES-III (Acoustical System)

Course Code: BAR 406 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To acquaint students about acoustical requirements and consideration for building design right from residential to the theatre type of building.

Course Contents:

Module I: Terminology in Acoustics- 1 weeks

Sound and its properties, audible sound, intensity and loudness, frequency and pitch, quality Reflection, absorption, transmission, diffusion, diffraction of sound ; Common acoustical defects: Echo, sound-foci, dead spots, sound shadows, resonance, insufficient loudness, external noise, reverberation and reverberation time.

Module II: Acoustic materials - 1 weeks

Sound absorbing materials and their applications– description and characteristics, types of absorbents and reflectors and their application, Market survey and sample collection.

Module III: Acoustical design case studies - 1 weeks

Study of existing designs to understand shapes/spaces and integration of acoustical equipment in the design.

Module IV: Noise control- 1 weeks

Environmental noise control: noise sources, airborne and structure-borne noise, transmission of noise, methods of environmental noise control, control of mechanical noise and vibrations, General idea of sound insulation. Noise control in specific types of buildings like – auditoriums, residential buildings, hotels, school, hospitals, offices, libraries.

Module V: Artificial Lighting- 1 weeks

Introduction to basic photometric concept: Light its behaviour and properties, Instruments for measurement lux meters, field of vision, visual task, visual comfort and glare: objectives of lighting design in architecture.

Module VI: Design Exercise- 2 weeks

Acoustical design or case study of existing building such as auditorium, recording studio, theatre, cinema halls, hospitals or a multistory office building.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Templeton, Duncan & Saunders, David, "Acoustic Design", The Architectural Press, London, 1987.
- Templeton (ed.), "Acoustics in the Built Environment", Butterworth, London, 1993.
- NBC of India
- K.A.Siraskar-Acoustics in building design
- Building Construction - B.C. Punmia
- Building Construction - Rangawalla
- Building Construction and Materials – Gurcharan Singh
- Architectural Acoustics: E. David
- An Introduction to Building Physics: Narsmhan
- Fundamentals of acoustic by Kinsler, Lawrence E and others
- Enviromental acoustic by Doelle, Leslie L.
- Knudson and Harris, `Acoustical Designing to Architecture'.
- David Egan, `Architectural Acoustics' Ross publishers, 2008.
- Ducan Templeton et all 'Acoustics in the Built Environment, Architectural press1997

BAR 407 Study Tour, NASA&other Academic/Professional activities-I (evaluation)

Course Code: BAR 407 Credit Units: 01 Teaching hours: NIL

Guidelines:

- Students shall visit different sites and prepare a report covering different aspects
- The report shall be evaluated and marks shall be added in even semester, for study tour.
- It shall be related to the studies done in history of architecture, art & culture and Architecture Design of current & pervious semester.
- Student will be marked for work done for national / Zonal convention of NASA (National Association of student of architecture) & any other activity related to NASA. Participation of every student will be compulsory in activities related to NASA though every student may not be attending the same. Report will be submitted for evaluation of NASA work.
- Marking will be done for work done for NASA, in current & pervious semester.
- Evaluation for all extracurricular activities will be done in this course (for current & pervious semester).

The Layout Guidelines for the Report

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm
- The report can be hand written as well
- The report shall be properly bound and submitted individually.

Assessment Scheme:

Continuous Evaluation:	50% (Based on punctuality, regularity of work.)
Final Evaluation:	50% (Based on the Documentation in the file/ presentation/ viva)

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BAR 408 ARCHITECTURAL CLIMATOLOGY

Course Code: BAR 411Credit Units: 02L/1-ST/1-P/0 Teaching hours: 02

Course Objective:

- To acquaint students to various concepts of climate analysis and its use in Architecture.
- To familiarize students with human thermal comfort as an essential function of building. Students shall learn using the natural climatic elements to achieve their maximum utilization for the minimum dependence on the artificial means.

Course Contents:

Module I: Introduction to Climate

Importance of climate in architecture, Factors affecting climate.

Elements of climate- Solar radiation, temperature, wind, humidity and precipitation and their measurement.

Module II: Tropical Climate

Climatic zones, Characteristics of tropical climate, macroclimate and microclimate.

Module III: Human thermal comfort

Study of body's heat production and heat loss, comfort zone, bio-climatic chart and effective temperature, Isopleths. Solar passive techniques: cooling and heating.

Module IV: Day light and shading devices

Natural light, glare, day light factor and day lighting in tropics.

Method of recording the position of sun in relation to earth, solar chart, shadow angle protractor and its application in design of shading devices.

Module V: Orientation, Ventilation and air movement

Requirement, size and position of openings, air flow pattern inside and outside buildings.

Orientation of buildings in relation to sun and wind.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Manual of tropical housing and building, Koenisberger Solar power, Behling
- The climatic data handbook, Bhargava and Chand

References:

- Climate responsive Architecture, ArvindKrishan Architecture as response, Gree.

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BAR 409BAMBOO ARCHITECTURE

Course Code: BAR 409Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objective:

To familiarize the students with sustainable building material bamboo and its application in present technological change. The student shall learn the use of Bamboo for various kind of construction and application.

Course Contents:

Module I: Introduction to Bamboo as a Material

Introduction to bamboo and its different types and properties.General uses of Bamboo.Discussing bamboo growth and forms.Studying about bamboo as a material since history and its application being a versatile and fibrous material. Botanical Classification, Types based on Geographical distribution, climatic and soil conditions. Difference between Bamboo, Cane and Reed.Comparison of bamboo with wood.Harvesting, Storage and Drying of Bamboo.Active and Passive methods of Bamboo Preservation and Treatment.Working with Bamboo.Cutting, Sawing and Scorch Drilling of Bamboo.Types of Joints in Bamboo Construction. Shaping and Bending of Bamboo. Treatment of Bamboo Surface using Bleaching and Dyeing methods.

Module II: Bamboo as a Construction material.

Studying the grading of bamboo and its selection and size of bamboo for structure. The different traditional tools used for construction with their application. All the joinery in the structure based on types of lashing and types of shear keys.
Bamboo Reinforced Foundation. Bamboo Flooring.Bamboo Trusses & Roof Skeleton.Bamboo Shingles.Bamboo Walls.Bamboo Doors & Windows.Bamboo Furniture.Bamboo as a Scaffolding material.Bamboo Footbridges and Bridges.Reed Boards & Bamboo Ply.
Construction details in Bamboo.Types of Binding ,Joints& Connections. Various steps involved-required sizes of members-methods of joining bamboo for various applications.

Module III: Building System & Component

Studying bamboo treatment for longer life of shelter.Analyzing the consideration for site selection.Deatiling the construction of bamboo substructure and superstructure plus covering envelopewith reference to latest technology.

Module IV: Bamboo products

Bamboo products such as Mats (Chatai), laminates, furniture, flooring, lampshades, furniture etc.

Module V: Live Exercise of Documentation, Workshop & Site Visit

Designing a bamboo structure residential/institutional/recreational etc. based on new technologies and innovations in the field. Case study of Bamboo Houses and Buildings.
Site visit to Built environments that have used Bamboo as a Construction material especially in Assam, Meghalaya, Auroville and Kerala.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- The Book of Bamboo by David Farrelly
- Building with Bamboo: A Handbook by Jules J.A. Jansen Bamboo Style by Gale Beth Goldberg

References:

- Bamboo by Susanne Lucas
- Bamboo Architecture & Design (59 Case Studies) by Eduard Broto New Bamboo: Architecture and Design by Marcelo Villegas

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BAR 410 ARCHITECTURE DOCUMENTATION

Course Code: BAR 410 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

- To familiarize the students with various aspects, issues and considerations related to the documentation of architecture and its characteristics so that its heritage and inherent values can be identified and recorded.

Course Contents:

Module I: Introduction to Architectural Documentation - 2 weeks

Introduction to documentation of historical buildings includes not only measured photographic survey, but also surveying of the qualities of building spaces and their elements. Identification and understanding the use and purpose of the documentation.

Module II: Methodology- 3 weeks

Detailing the purpose, scaled drawings, photographic documentation, visual analysis, classification and mapping of the spaces and their elements. The originality of these spaces and elements are evaluated within the frame of research results that are previously published, site surveys made. Use of modern equipment such as 'CANVAS' and its interface with I-pad and AutoCAD etc to be understood.

Module III: Analysis - 3 weeks

Visual analysis consisting of analysis of spatial element and architectural elements need be understood. The spaces grouped according to their functions and the elements grouped according to their types. Visual analysis of onsite elements, outside elements need to be recorded. The context of the building need to be understood and recorded.

Module IV: Evaluation &Characterstics- 3 weeks

Distinguishing the modern with traditional architecture in terms of elements, details etc. Sketching and tabulating the spatial characteristics and their types

Module V: Compilation & Assessment - 3 weeks

Classification and comparison is an effective way to decipher architectural characteristics of a historical Building with its originalities and alterations. The compilation should be as realistic as possible without the opinion of the compiler to retain the authenticity of the project.

NOTE-Students may be assigned a case study to assess the understanding of the subject.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Glenn E. Wiggins, Manual of Construction Documentation: An Illustrated Guide to Preparing Construction Drawings, 1989, Whitney Library of Design.
- John H. Stubbs, Robert G. Thomson, Architectural Conservation in Asia: National Experiences and Practice.
- Wiley, Landscape Architecture Documentation Standards: Principles, Guidelines, and Best practices, 2016, John wiley& sons inc.
- Architectural Heritage, New Technologies in Documentation: Council of Europe, 1990

BAR 411 BARRIER FREE ARCHITECTURE (Enable Design)

Course Code: BAR 411 Credit Units: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

The objective of course is to learn the principles of barrier free designand concepts ofuniversal design. It Provides an idea about barrier free construction principles in buildings while understanding of the key aspects and systems of specially able persons built space in architecture.

Course Contents:

Module I: Special Abilities

Understanding the different human imparities such as visual, mobility and hearing and also understanding the abilities of such differently able persons.To understand the architectural requirements of such persons.

Module II: Introduction to Architecture for specially able

Defining the basic concepts of barrier free design, need for barrier free concepts in architecture, concepts of universal design and types of disabilities. Design principles for barrier free architecture and accessibility for all.

Module III: Barrier free elements for outdoors and Urban Design

Design elements outside the building like curb ramps, pedestrian crossing, public toilets, and parking, signage, flooring and street furniture. Case examples of Barrier free architecture in India and across the globe. To study the anthropometrics and dimensions of mobility devices, special fixtures for barrier free design. Barrier free construction materials and dimensions for flooring, walls, doors, windows, staircases, elevators, toilets, entrances and corridors.

Module IV: Laws

Knowledge of different laws prevailing within India and in other countries**.**Understanding implication of different laws on design of spaces.

Module V: Case Study, Presentation & Design elements

Barrier free architecture in Public Buildings – dimensions and standards.Case Study of Barrier free elements in Public buildings, Photographic documentation and Presentation.Incorporation of barrier free elements in project being pursued in architectural design.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Guidelines and Space Standards for Barrier Free Built Environment for Disabled and Elderly Persons – Central Public Works Department, Ministry of Urban Affairs & Employment, India, 1998
- IS – 4963 (1987), Recommendations for buildings and facilities for Physically Handicapped
- Barrier-Free Design: Principles Planning, Examples, by Oliver Heiss, Christine Degenhardt, Johann Ebe (Birkhauser Architecture, 2010)

BAR 501 DESIGN – V

Course Code: BAR 501Credit Units: 7 L/2-ST/5-P/0 Teaching hours: 07

Course Objectives:

- To impart significance of context in Architectural Design through response to climate, environment, **bylaws** and culture
- To introduce basics of planning of small campuses/complex involving more than one building blocks.
- To introduce considerations for achieving Sustainability through Architectural Design.

Course Contents:

Module I: Introduction

Introduction to context as strong determinant of architecture of any location with examples, Climate and Culture as comprising factors of context; Project introduction for studio exercise

Module II: Case studies, Site Studies and Literature Studies

Study of a vernacular settlement with emphasis on socio-economic characteristics, climate and other geomorphic factors, local materials, building techniques, building typology, urban form, spatial analysis etc; Literature Review – Design Standards and Codes, Comparative Analysis and Area statement

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, efficiency of design to be worked out and finalized.

Module V: Presentation

Enhancement of presentation skills using multiple media. Creation of 3-D models based on the design. Preparation of perspective views (internal & external). Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. . ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include problems having multi - building blocks complex such as a tourist resorts/ three-star hotel, youth hostels, Craft workshops and Centers, Haats, Social upliftment /empowerment centers etc with emphasis on climatic design. Sites may be chosen in different climatic regions in India except in hilly regions etc.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR 502 MATERIALS & CONSTRUCTION TECHNOLOGY – V

Course Code: BAR 502 Credit Units: 03 L/1-T/2-P/0 Teaching hours: 03

Course Objective:

- To familiarize student with different materials in flooring, roofing and interior and exterior finishing and their use in building works.

Course Contents:

Module I: Flooring and paving: type and construction detail – 3 weeks

Soft and hard flooring Stone, Tile, Indian Pattern Stone (IPS) Flooring, Concrete pavers & Stamping, Wood, Epoxy, Vinyl, Carpets etc.

Classification, Manufacturing, Market availability and prices, Advantages/ Disadvantages, design and detailing etc.

Module II: False ceiling type and construction detail– 3 weeks

POP, Gypsum board, Acoustic panels, Wood, Metal etc.- Classification, Manufacturing, Market availability and prices, Advantages/ Disadvantages, Design and detailing etc.

Module III: Exterior and interior finishes– 3 weeks

Latest finishing materials and their applications in construction- ACP, PVC, Gypsum, Glass, Fiberglass, Glass bricks, Metals, Stone, Ceramics, Exposed brick work, Paints, POP, Polish, Varnishes

Module IV: Partition and paneling– 3 weeks

Partitions and Paneling, Cupboards/Cabinets in different materials

Module IV: Special Details– 2 weeks

Sliding door, Folding door, Revolving Door, sliding and folding door with hardware and their combinations'

Details such as nosing/railing /grills/balusters in different materials etc.

Exercises: Field trips, market survey of available materials, technology and hardware, preparation of study reports and presentation of seminars, preparation of drawings on above topics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building construction W.B.McKay Building construction R Berry
- Building construction Chudleys
- Building construction Francis D.K. Chings

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BAR 503 STRUCTURAL DESIGN & SYSTEM- V

Course Code: BAR 503 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To understand the Design of R.C.C. structures by using IS: - 456: 2000.
- To help the students for design the structural members like: - beam, column & slabs by using IS:456:2000 (based on working stress method) & implement in analytical software likes: - STAAD Pro V8i.

Course Contents:

Module I:Working stress method-4 weeks

Introduction, plain & reinforced concrete, objectives of structural design, Code recommendation for working stress method, stress- strain curve for ductility & brittle material, understanding the concept of elasticity. Behavior of concrete under compression & tension, creep & shrinkage of concrete, behavior in flexure.

Module II:Design of beams & one-way slabs-3 weeks

Introduction, requirements of flexural reinforcement, requirements for deflection control, Design of singly & doubly reinforced rectangular sections by using IS :- 456: 2000.

Module III: Design of two-way slabs-3 weeks

Design of wall- suspended two-way slabs, design of beam- supported two-way slabs, design of column- supported slabs, reinforcement details in column- supported two-way slabs.

Module IV:Design of Compression members-2 weeks

Introduction, estimation of effective length of a column, Code requirements on slenderness limits, minimum eccentricities & reinforcement, design of short column under- axial &uni-axial compression Design of column under axial compression with biaxial loading, design of slender column.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- M.V. Naik, Building Construction – Materials.
- Khurmi R.S., Strength of Materials.
- Khurmi R. S., Applied Mechanics and Strength of Materials.
- P.N. Khanna, Civil Engineering Handbook.s
- Sushil Kumar, Khurmi, Punmia, R.C.C. Design.
- Negi, Design of Steel Structure.
- Salvadori and Heller, Structure in Architecture.
- E. P. Popov, Mechanics of materials.
- R. Park and T. Paulay, Reinforced concrete structures.
- M.L. Gambhir, Concrete technology.
- N. Krishna Raju, Design of reinforced concrete structures.
- S. Unikrishnapillai&devdasmenon,.Reinforced concrete design.
- IS: 456- 2000
- SP: 16- 1980
- Morgan**,** Elements of Structure.
- Salvadori, Structures in Architecture.
- Mackey, WB, Building Construction Vol. 1-4.
- Chudley, Construction Technology Vol. 1-6.
- Mitchell, Elementary Building Construction.

BAR 504 GRAPHICS SKILLS – V (Computer aided)

Course Code: BAR 504 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

- To train student to create 3D in Revit.
- Understand different aspects of collaborative modeling, BIM based scheduling and estimating
- will have hands-on experience with advanced BIM solutions, which support collaborative and concurrent teamwork; view of the building industry

Course Contents:

Module I: Learning detailed 3D creation using Revit (Building Information Modelling (BIM) software)- 3 Weeks

Introduction about BIM, Introduction to Autodesk Revit Architecture, Revit File Types, Exploring User Interface, Building Elements, starting a New Project and importing other files in Revit, Drawing Plan as per Dimension. Creating detailed 3D (Exterior & Interior) of an Architectural project and generating its Plan(s), Elevation(s) Section(s), view(s) a complete set of architectural drawings using Revit.

Module II: Learning 3D Rendering using Revit-3 Weeks

Advanced 3D creation and rendering in Revit. Material application, Lighting, Camera setting, Background, Scenic development for still 3d images and their final editing in Photoshop etc.

Module III: Learning 3D Animation using Revit-1 Week

Using Revit for developing 3D animation (walk through) for Architectural significance. Complete scenic development, material and lighting as well as camera positioning for moving images. Saving and viewing animations.

Module IV: Creating Complex forms/ shapes and printing-3 Weeks

Massing Introduction; Creating In-Place Masses using Forms, Extrusion, Revolve, Sweeps.Composing sheet and final presentation on Revit.

Importing and exporting Revit file into other software.

Module V: Learning BIM software Revit for Complex forms/ shapes-4 Weeks

Introducing a BIM Strategy document, Model management, Project team collaboration techniques, Transmittal and model issue protocols, Basics of large model sub-division, Exercise on work sets and task allocation

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Autodesk Revit user guide/manual.
- Autodesk Revit Architecture: Eric.

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BAR 505 BUILDING BY LAWS, CODES & PRACTICES

Course Code: BAR 505 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To study the development controls as applicable to building design. To acquaint the students to compulsory building bye-laws and permits.

Course Contents:

Module I: Introduction of By-Laws - 3 weeks

Introduction to Building Bye Laws and regulation, their need and relevance, general definitions such as building height, building line, FAR, Ground Coverage, set back line et all. Role of various statutory bodies governing building works like development authorities, municipal corporations etc. Introduction to Master Plan and understanding various land uses like institutional, residential etc. and related terminology

Module II: Application of By-Laws - 4 weeks

Interpretation of information given in bye laws including ongoing changes as shown in various annexure and appendices. Application of Bye Laws like structural safety, fire safety, earthquake safety, basement, electricity, water, and communication lines in various building types.

Module III: Introduction of Codes & Practices - 3 weeks

Introduction to various building codes in professional practice emphasizing the importance of codes and regulations to protect public health, safety and welfare and to ensure compliance with the local authority.

Module IV: Application of Codes & Practices - 4 weeks

Understanding the applications of various codes as per various building types. Conducting a comprehensive code search process and representing the above analysis by preparing detailed code data sheets as applicable in the domain which has been chosen for the research.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- 'Delhi Building Bye-Laws – Nabhi Publications D.D.A.– Delhi Master Plan
- Unified Buidling by laws of 2017 Rajasthan
- Various IS Codes

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BAR 506 BUILDING SERVICES- IV

Course Code: BAR 506 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

- To acquaint the student with the fire safety regulation and security systems to be adopted in the buildings. Study the development codes and bye-laws of fire safety regulations, and study about the different methods and materials for treatment in buildings for fire safety.

Course Contents:

Module I: Fire Safety- 1 weeks

Introduction: basic understanding about fire, growth decay curve. Causes of fire in buildings, types of fire, spread of fire, production of smoke and poisonous gases. Fire safety and preventive measures.

Module II: Fire properties of materials- 2 weeks

Basic fire properties of materials i.e. ignitability, combustibility, surface spread of flame, fire propagation, toxicity etc.: General behavior of materials, combination of fire retardant and non-combustible materials.

Module III: By-laws for firefighting - 2 weeks

Firefighting regulations with reference to National Building code. Fire escape, stairways and escape routes, dry and wet risers, Water demand for firefighting, storage tanks, fire hydrants etc.

Module IV: Fire extinguishing- 1 weeks

Study of Fire detection systems, smoke detectors, heat detectors, fire alarms etc.Fire extinguishing systems, Unit fire extinguishers, Chemical and foam extinguishers, Chemical and foam extinguishers.

Module V: Advance Security Systems - 1 weeks

Communication systems in buildings, CCTV, conduits to accommodate the systems.Security and Surveillance. Remote control for security systems and automation

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Fire Safety: National Building Code of India 1983, An Introduction to Building Physics: Narsmhan
- Fire Safety in Buildings by V.K. Jain
- Brannigan, F. L. & Corbett, G. P. (2008).Brannigan's Building Construction for the Fire Service. Sudbury, MA: Jones & Bartlett Publishers.

BAR 507BUILDING APPRECIATION

Course Code: BAR 507 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course objective:

The objective of the course is to introduce the students to the practice of appreciating architectural built forms.

Course contents:

Module I: Introduction

Introduction to building appreciation and analysis of the evolution of buildings and its necessity. Introduction also includes guidelines and parameters to appreciate any building.

Module II: Aesthetic Interpretation

The interpretive understanding of aesthetic experience provides with the opportunity to develop their interpretive skills and heighten their aesthetic responses to various building forms, building textures and building expressions. Analyze, interpret and respond to architectural examples done by architects from past and present. This also includes appreciation of historical works and background of previous era.

Module III: Historical Perspective

Examining historical perspectives help realize the need to understand the past and thoughtfully consider the future to contextualize current knowledge about buildings and their elements. Identify and describe appropriate systematic and scientific strategies to examine historical built forms and methods.

Module IV: Guidelines for Building Appreciation

Develop critical thinking skills, ability to reflect and explain the meanings of architectural works

Understand how architectural building works shape and reproduce social ideas, values and concerns and how they interact with and influence society, history and culture.

Note: Students shall be given an example of Building appreciation to record their experiences

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Kenneth Lindley, Appreciation of Architecture: Landscape and Building (C.I.L.) Paperback – February, 1972
- Carol Davidson Cragoe, How to Read Buildings: A Crash Course in Architectural Styles, Rizzoli, 2008 Francis D.K. Ching , A Visual Dictionary of Architecture, Wiley, 1996
- Kevin McCloud, Grand Designs Handbook: The blueprint for building your dream home, Collins ,2009

BAR 508 ENERGY CONSERVATION ARCHITECTURE

Course Code: BAR 508 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To familiarize students with principles, techniques and guidelines for planning and design of energy conserving architecture.
- Study of solar energy systems and other alternative sources of energy being used in architectural applications.

Course Contents:

Module I: Introduction - 2 weeks

Classification and characteristics of energy resources, Use and exploitation of resources, Resource use in architecture / exploitation of resources for development, Resource shortage and constraint, Concepts and need for conservation, Renewable, non-renewable resources and alternate sources of energy. Need and necessity of energy conservation.

Module II: Energy conservation Architecture - 3 weeks

Principles of energy conservation, Pattern of energy use in buildings, Technologies and methods of conservation, Economic, technological and environmental implications. Ambient energy and lifecycle requirement of energy in different types of buildings.Use and possibility of alternate sources of energy.

Module III: Conservation of other resources - 3 weeks

Conserving building materials, water, land etc. in architecture, methods of conservation and their implication.Understanding the concept of zero energy buildings.

Module IV: Design of ECA - 3weeks

Fundamentals of planning and design, Elements and principles of design, Study of design problems, Application of relevant principles for design solutions, Innovative and appropriate construction technologies. Use of landscaping elements in energy conservation.

Module V: Exercise - 3 weeks

Students shall workout a practical exercise of converting one of their designs into energy conserving building.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Alternative Natural Energy Sources in Building Design: Davies and Schubert.
- Design with nature: I. McHarg
- The Ecological Context: H. McHale.
- Energy Conservation Standards: for building design, construction and operation, S. Fred Dubin

Online Resources

- https;//www.IGBC.com
- https;//www.ECBC.com
- https;//www.GRIHA.Org

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BAR 509 DIGITAL ARCHITECTURE

Course Code: BAR 509 Credit Units: 02 L/1-T/1-P/0 Teaching hours: 02

Course Objective:

To familiarize student with digital architecture

Course contents

Module I: Digital Architecture

Introduction to Digital Architecture, Digital Architecture terminologies, digital theories and History of Digital Architecture, Difference between conventional design approach and Digital design process,

Module II: Digital Architecture software:

Introduce to digital Design Process, Software as design tools, Associative modelling, Concept of artificial intelligence, Application of expert system in architecture.

Module III: Digital Techniques in Architecture

Building Automation System, Current trend and innovation, Effect of building automation on functional efficiency, Components of Building Automation, Application of 3D printing machines and techniques.

Module IV: Parametric design:

Relation of **Architecture and Algorithm,** Basic Application of algorithmic techniques in design methodologies, coding principles, artificial life, material intelligence

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Contemporary Processes in Architecture – by Ali Rahim
- Digital Cities AD: Architectural Design – Prof. Neil Leach
- Performative Architecture : Beyond Instrumentality – by BrankoKolarevic
- Versatility and Vicissitude: Performance in Morpho-Ecological Design- by Michael Hensel
- Biosensors for environmental monitoring – by Ursula Bilitewski, Anthony Turner
- Biosensor principles and Application – by LoicJ.Blum, Pierre R.Coulet
- Digital Tectonics – Prof. Neil Leach
- Contemporary techniques in Architecture – by Ali Rahim
- Digital Fabrications: Architectural and Material Techniques- by Lisa Ewamoto

BAR 601 DESIGN – VI

Course Code: BAR 601Credit Units: 7 L/2-ST/5-P/0 Teaching hours: 07

Course Objectives:

- To understand Design constraints pertaining to buildings requiring integration of basic services and structures; building on hilly terrain(contours); buildings forming a complex
- To investigate design issues pertaining to above typologies
- To create architectural design for above typologies

Course Contents:

Module I: Introduction

Introduction to parameters that control design criteria for buildings that require integration of basic services and structures; constraints and design strategies for building on hilly terrain and designing for variety of buildings that are part of same complex with examples. Project introduction for studio exercises.

Module II: Case studies, Site Studies and Literature Studies

Case Studies – primary and secondary; Site and surroundings survey- location, local climatic conditions, topography, existing landscape, socio- cultural impact on design; Literature Review – Design Standards and Codes, Comparative Analysis and Area statement

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, integration with structures and services, efficiency of design to be worked out and finalized.

Module V: Presentation

Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include projects like Housing, Auditorium, Museum, Institute campus on Hills/plains, shopping malls etc.

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR 602 MATERIALS & CONSTRUCTION TECHNOLOGY – VI

Course Code: BAR 602 Credit Units: 03 L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

- To acquaint the students with working drawing in construction work.
- To expose the students to preparation and usage of working drawings on site.
- To familiarize with requirement of the working drawing, its essentials and levels of details required so that work could be executed at site without any further assistance.

Course Contents:

Module I: Introduction to Working and submission Drawing – 1 week

Introduction to the topic and its relevance in the construction field.Aspects such as – construction terminology, building bye-laws, requirements of submission and completion / compounding of projects to be discussed.

Module II: Dimensions system – 2 weeks

Dimension system at building and site level

Module III: Working Drawing I– 3 weeks

Plans, section and elevation

Module IV: Working Drawing II– 3 weeks

Typical structural detail. Excavation and shuttering working drawing and detail

Module V: Working Drawing III - 2 weeks

Toilet / kitchen & staircase details

Module VI: Working Drawing IV - 2 weeks

Flooring handling pattern, Landscaping's

Module VII: Roof drainage, flashing - 2 weeks

Detail of terracing for flat roofs.

Water proofing and rainwater disposal.

Exercises

Making complete set of working drawings and details for a small two storied building designed in the previous semester, with necessary changes made as per the local bye-laws.

List of drawings-

Architectural drawing-Site Plan, All Floor Plans, Elevations, Sections, Doors and Windows scheduleand details,

Structural drawing- Foundation Layout and details

Services drawing-Electrical and Plumbing layouts, HVACs layout.

Details drawing-Kitchen, Toilet, staircase details, Flooring Pattern, Details of grills, Parapet orrailings, typical wall section with complete details.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Elements of Structure by Morgan
- Structures in Architecture by Salvadori
- Building Construction by Mackay WB Vol. 1-4 Construction Technology by Chudley Vol. 1-5

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BAR 603 STRUCTURAL DESIGN & SYSTEM- VI

Course Code: BAR 603 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To understand the design of Steel structures by using: - IS 800: 2007/1984.
- To help the students for understanding the design of steel structures members like: - beam, columns & girders by using IS: - 800; 2007 (based on limit state method) & implement in analytical software's like: - Tekla Bentley version.

Course Contents:

Module I:Limit state method-2 weeks

Introduction, steelwork connections: -rivet, weld, bolt & pinned connections, failure & strength of a welded joint, working stresses in rivet joint, modes of failure of a riveted joint

Module II:Design of tension members-2 weeks

Introduction, types of tension member, net sectional area, net effective areas for angles & tees in tension. Permissible stresses, design of members subjected to axial tension & bending, lug angles.

Module III:Design of compression members-2 weeks

Introduction, modes of failure of a column, buckling failure: - Euler's theory, Ideal end conditions and effective length factors, radius of gyration & slenderness ratio, various column formulae, IS codes formulae, common shapes of compression members, strength of compression members, general specification for compression member, design of compression member

Module IV:Girders-2 weeks

Introduction, loads acting on girder, permissible stresses, types of girders & crane rails.

Module V:Advanced design for shear in beams-3 weeks

Design of advance R.C.C. Structures: - Strip & yield line method, Shear friction, horizontal shear transfer, composite concrete beams, design of shear walls, strut- & tie model, truss model, deep beams, bearing & shearing walls & corbels.

Module VI:Design for earthquake resistance-3 weeks

Effect of confining the concrete & introducing the famous models, flexural hinges & their lengths ultimate deformation & ductility of members with flexure, moment curvature relationship, cyclic behavior of beam- column member, redistribution of moments in reinforced beams, design of beam column joint.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- P.N. Khanna, Civil Engineering Handbook.
- B.C. Punmia, Design of steel structures.
- Negi, Design of Steel Structure.
- Salvadori and Heller, Structure in Architecture.
- E. P. Popov, Mechanics of materials.
- J. Sterling Kinney, Indeterminate structural analysis.
- C.S. Reddy, Basic structural analysis.
- R. Park and T. Paulay, Reinforced concrete structures.
- M.L. Gambhir, Concrete technology.
- N. Krishna Raju, Design of reinforced concrete structures.
- IS: 800- 2007
- SP: 16- 1980
- N. Krishna Raju**,** Advance R.C.C. design.
- A.k. Chopra, Dynamics of structures.
- Chudley, Construction Technology Vol. 1-6
- K. R. Arora, Advance concrete design.
- IS: - 3370, IS: - 1893.
- Special publication -6 (SP-6)
- Birla publication, Steel tables
- Morgan, Elements of Structure.
- Salvadori, Structures in Architecture
- Mackay WB, Building Construction Vol. 1-4
- Chudley, Construction Technology Vol. 1-6
- Elementary Building Construction by Mitchell
- Everet, Structure and Fabric.
- Tekla software.With Bentely version V8i.
- Morgan, Elements of Structure.
- Salvadori, Structures in Architecture.
- Mackay WB, Building Construction Vol. 1-4
- Mitchell, Elementary Building Construction.

BAR 604 QUANTITY SURVEYING & SPECIFICATIONS

Course Code: BAR 604 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To familiarize the students with the theory and practice of estimation and quantity surveying. To develop the understanding of specification writing.

Course Contents:

Module I: Introduction - 1 week

Definition, importance and uses of specification – principles and practice; method of writing specification; form and sequence of clauses, calculation of length according to long & short wall method, center line method.

Module II: Material Specifications - 2 weeks

Writing detailed specification for various common building materials e.g., bricks, sand, lime, timber, glass, paints etc.; specification of new building materials.

Module III: Specifications of Simple construction - 2 weeks

Writing detailed specification for various building construction works.

Module IV: Schedule of Rates - 2 weeks

Specification of BIS and other institutions; general Abbreviations used in specifications.

Module V: Introduction to Estimate - 2 weeks

Introduction to cost estimation and definitions of terms related to estimates.

Module VI: Types to Estimate - 2 weeks

Types of estimates, abstract and detailed estimates; detail estimates – methods of estimating; taking out of various items; preparation of bill of quantities – use of schedule of rates; analysis of rate and break up of material requirements.

Module VII: Cost accountancy & Book keeping - 2 weeks

Introduction to cost accountancy and book keeping.

Module VIII: Rate Analysis - 1 week

Principles of analysis of rates, rates of labour and materials, rate analysis in different building works.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Estimating and Costing in Civil Engineering: B. N. Dutta
- Estimation, Costing & valuation by M. Chakraboty.
- Handbook on Building Economics and Productivity, Central Building Research Institute, Roorkee: S.C. Singh and G.C. Sofat.
- Civil Engineering Handbook – P.N. Khanna
- R.C.C. Design – Khurmi, Punmia, Sushil Kumar

BAR 605 LANDSCAPE DESIGN & SITE PLANNING

Course Code: BAR 605Credit Units: 03L/1-ST/2-P/0 Teaching hours: 03

Course Objective:

To acquaint the student with the various natural elements used to design transitional and outside spaces and establish a linkage between nature and the built environment

Course Contents:

Module I: Introduction

Definition, scope, landscape architecture in relation to architecture. Landscape design elements and principles, historical review of gardens in India, Persia, Japan, Italy, France and England, contemporary landscape design

Module II: Characteristics and use of plants

Characteristics of various types of plants/trees/shrubs/creepers/edges/hedges etc., and their suitability for landscaping; plant selection criteria, planting design.

Module III: Site Analysis and planning

Analysis of site with respect to topography/ slope, hydrology/ drainage, geology/ soil, vegetation, views – on site/ off site and their consideration in design and planning

Module IV: Landscape Design and maintenance

Landscape design for various building types; landscaping parks and roads, rock gardens, terrace gardens, landscaped courts. Preparation of landscape schemes; Landscape construction. Maintenance & phasing of landscape schemes.

Module V: Landscape design elements

Landscape design element such as sculptures/ benches/ umbrellas/ fences/ posts etc. their design, selection and incorporation in landscape/ site planning schemes.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- An Introduction to Landscape architecture by M. Laurie. An Introduction to Landscape Design by H. V. Hubbard
- Fundamentals of Landscaping and Site Planning by James B. Root. History of Garden Design by D. Clifford
- Tropical Garden Plants in Colour by Bose and Chowdhury

References:

- Colour and Design for Every Garden by Ortloff and Raymore Design with Nature by I. Mcharg
- The Way We Live by Alfresco
- New Landscape Design by Robert Holden Fundamentals of Ecology by M. C. Dash. Landscape Detailing by Michael Ittlewood.

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BAR 606 BUILDING SERVICES-V

Course Code: BAR 605 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To Integrate of HVAC system with building design &its application. To expose the students to the areas of air-conditioning, heating and ventilation in buildings of various types so that there integration could be done in most appropriate manner right at the design stage.

Course Contents:

Module I: Ventilation- 1 weeks

Natural and artificial ventilation systems; estimation of ventilation requirements; mechanical ventilation in buildings; scheme and equipment required for ventilation spaces like industrial kitchens, underground garages, and multistoried buildings and parking spaces.

Module II: Air conditioning- 2 weeks

Principles of Air conditioning; concept of thermal comfort; physiological principles; reaction of human body to the thermal environment; principles of psychometric; psychometric chart; selection of indoor and outdoor design conditions; refrigeration and air cycle; cooling and heating load calculations; various systems of air conditioning; duct work and air conditioning layout, fittings and fixtures; evaporative cooling, fair conditioning and its suitability. Types of systems- cooling tower, geothermal heating and cooling

Module III: Equipment's- 1 weeks

Scheme and equipment required for HVAC; their placement and physical space requirements.

Module IV: Load Calculation- 1 weeks

Cooling and heating load calculations; Introduction to British thermal unit and other factors; various systems of air conditioning; duct work and air conditioning layout, fittings and fixtures; evaporative cooling.

Module V: HVAC Design- 2 weeks

Design and drawing of HVAC system for a building designed in previous semester.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Manohar Prasad, 'Refrigeration & Air conditioning'
- C.P. Arora, 'Refrigeration & Air conditioning'
- Modern Air-Conditioning, Heating and Ventilation: Carrer and G. Pitman.
- Air Conditioning and Ventilation, Servems and Fellows, John Wiley
- Ernest Tricomi-ABC of Air conditioning
- Basics of Air conditioning by ISHRAE
- All about Insulation by ISHRAE
- ISHRAE HVAC Handbook 1997 Part - 1 -Air Conditioning
- ISHRAE HVAC Handbook 2004 Industrial Ventilation Applications
- ISHRAE The Hand Book on Green Practices

BAR 607 Study Tour, NASA&other Academic/ Professional activities-I (evaluation)

Course Code: BAR 607 **Credit Units: 01** **Teaching hours: 00**

Guidelines:

- Students shall visit different sites and prepare a report covering different aspects
- The report shall be evaluated and marks shall be added in even semester, for study tour.
- It shall be related to the studies done in history of architecture, art & culture and Architecture Design of current & pervious semester.
- Student will be marked for work done for national / Zonal convention of NASA (National Association of student of architecture) & any other activity related to NASA. Participation of every student will be compulsory in activities related to NASA though every student may not be attending the same. Report will be submitted for evaluation of NASA work.
- Marking will be done for work done for NASA, in current & pervious semester.
- Evaluation for all extracurricular activities will be done in this course (for current & pervious semester).

The Layout Guidelines for the Report

- A4 size Paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top and bottom margins: 1 inch/ 2.5 cm; left and right margins: 1.25 inches/ 3 cm
- The report can be hand written as well
- The report shall be properly bound and submitted individually.

Assessment Scheme:

Continuous Evaluation:	50% (Based on punctuality, regularity of work.)
Final Evaluation:	50% (Based on the Documentation in the file/ presentation/ viva)

BAR608 INTELLIGENT BUILDINGS

Course Code: BAR 608 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

To introduce the concept of intelligent buildings and to acquaint the student with the factors to be taken into consideration to build an intelligent building and basic concept of Artificial Intelligent and how it is helpful for building construction technologies.

Course Contents:

Module I: Introduction to intelligent buildings - 2 weeks

Definition of IB(Intelligent Building) according global and Indian context, Concepts, purpose and scope of intelligent building.

Module II: Intelligent Systems in Building - 3 weeks

Intelligent HVAC, Intelligent lighting, intelligent security, Intelligent firefighting, Intelligent openings, Intelligence with respect to telecommunications and network connectivity like WIFI etc.…

Module III: Building Automation System - 3 weeks

Application, Current trend and innovation, Effect of building automation on functional efficiency, Components of Building Automation, Automation system inBuilding Services and theirIntegrated approach in design, maintenance and management system, Concept of artificial intelligence, Application of expert system in architecture.

Module IV: Expert System - 3 weeks

Introduction to expert system, objectives, features and components of expert system, Applications of Expert Systems, benefits and limitations of Expert Systems

Module V: Artificial Intelligence - 3 weeks

Introduction to artificial intelligent, intelligent behavior, Development of Artificial Intelligence, Concepts of Artificial Intelligence, Applications of Artificial Intelligence.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Intelligent Building Systems, Authors: Ting-pat So, Albert, WaiLok Chan
- Intelligent Buildings: An Introduction, Edited by Derek Clements-Croome
- Smart Buildings, Author Jim Sinopoli
- Intelligent buildings: applications of IT and building automation to high technology construction projects, Author:BrianAtkin
- Artificial intelligence: Building intelligent systems, Authors ParagKulkarni, Prachi Joshi

References:

- Intelligent Building System for Airport, ASHRAE Journal V-39 N 11, Nov. '97 pp. 31-35 Maintenance System of Electrical Facilities Proceedings of the Annual Conference, 1997.

Online Resources

- An Intelligent Expert Systems' Approach to Layout Decision Analysis and Design under Uncertainty DOI: 10.1007/978-3-540-76829-6_12
- The use of expert system building tools in process planning. https://doi.org/10.1016/0952-1976(92)90095-2
- Intelligent building, definitions, factors and evaluation criteria of selection. https://doi.org/10.1016/j.aej.2018.07.004
- https://www.intelligentbuildings.com/

BAR 609 VASTU IN ARCHITECTURE

Course Code: BAR 609 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To educate the students on VastuShastra so that our own built environment should be in harmony with the energy of the inmates living in it.
- To expose the students to the various theoretical and practical aspects of VastuShastra.To familiarize with the ancient mode of designing a building in amalgamation with the latest technologies available.

Course Contents:

Module I: Introduction - 3 weeks

Introduction to Vastu, History of Vastu, Vedas and other ancient books, Growth of Vastu, Vastu and today, Scientific definition of Vastu, Solar Passage & Buildings with research referencing, Solar Energy, Humans & Buildings, Cosmic Energy & Flow.

Module II: Vedic Vastu- 3 weeks

Concept of Vedic Vastu, VastuPurush, Mandalas, Five Elements Theory, Planets & Directions.

Module III: Planning as per Vastu- 4 weeks

Direction and Corners, Eight directions, Importance of directions, Slope & Loading Pattern, Open space & balconies, Shapes, Vedic opinion on entries, Alternative opinion on entries, Main Door & Main Gate. Planning for Bedroom, Kitchen, Puja room, Bathroom, Children's room, Drawing Room, Living Room, Office Room.

Module IV: Land and Location as per Vastu- 4 weeks

Angles in a Plot & Building, VeedhiShoola, Angles &Extentions, Shermukhi&Gaumkhi plot, Good & Bad Location. Selection of land & soil test, Examination of the land as per Mayamata&BrahitSamhita, Types of Land as per Vedic books, auspicious land &Inauspicious land, Obstructions.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- 'B.B. Puri, Applied VastuShastra in Modern Architecture
- Michael Borden, Vastu Architecture: Design Theory and Application for Everyday Life
- Kathleen Cox, Vastu Living: Creating a Home for the Soul
- Talavane Krishna, TheVaastu Workbook: Using the Subtle Energies of the Indian Art of Placement
- Sherri Silverman,Vastu: Transcendental Home Design in Harmony with Nature
- RohitArya, Vaastu: The Indian Art of Placement
- Maharishi Vastu, Vastu City Planning: Sustainable Cities in Harmony with Natural Law
- Kathleen Cox, the Power of Vastu Living: Welcoming Your Soul into Your Home and Workplace
- Juliet Pegrum, TheVastuVidya Handbook: The Indian FengShui
- Kathleen Cox, Space Matters: Use the Wisdom of Vastu to Create a Healthy Home. 11 Top Designers Show You How
- Satish Grover, Traditional Indian Architecture
- Bubbar,D K, The spirit of Indian architecture: Vedantic Wisdoms of Architecture for Building Harmnious Space and Life

BAR 610 ARCHITECTURE PEDAGOGY

Course Code: BAR 610 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To acquaint students with the history of development of education methods in architecture.
- To introduce the students with the prevailing models of teaching-learning methods and their application in architectural design education.
- To familiarize students with the skills to evaluate architectural design and other art forms.
- To introduce research methodology, paper writing and presentation as tools to transmit knowledge

Course Contents:

Module I: History & development of architecture education - 2 weeks

Traditional teaching methods of India – Gurukul, Universities of Nalanda&Takshashila; Transmission of knowledge in architecture through temple architecture in ancient India; History of formal architecture education in West and in India.Peculiar requirements of Architecture Education, Requirements of generation of creative thinking.

Module II: Introduction to learning methods - 3 weeks

Aims and objectives of architecture education in India, Blooms Taxonomy, Levin's field theory, Carl Roger's theory of experiential learning, Peculiar requirements of Architecture Education; Models of Teaching: Advanced Organizer, Concept Attainment Model, Simulations – Use of advanced softwares to shape and visualize ideas, Synectics, Concept Mapping for organizing & communicating ideas, Basic aspects of classroom management

Module III: Design Process Pedagogy - 3 weeks

Various thinking skills, tools and techniques adopted by architects for deriving design ideas, Development of Design Thoughts, Experiential learning (case study methods) as guide in Design process, Use of synectics in the design studio, the essence of creativity in synectics, various forms of metaphoric thinking to activate "generative thinking."

Module IV: Assessment of architecture - 3 weeks

Arts, skill and technique of visual perception and form analysis, communication of the aesthetics of architecture and other associated art forms in a journalistic manner.

Module V: Research Methodology, Paper Writing & Presentation - 3 weeks

Research methodology, proposing projects for research design, standardized methods of paper writing and presenting.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- S. K. Mangal (2009)"Essential of educational technology", PHI Learning Pvt. Ltd., 2009.
- Bruce Joyce and Marsha Weils,"Models of Teaching", Pearson; 9 edition (April 14, 2014)
- Klausmier and Ripple (1971)"Learning and Human Abilities" Harper &Row, New York.
- Eames Charles & Ray, „An Eames Anthology", Yale University Press, Edited by Ostroff Denial.
- George Kneller(1971),"Philosophy of Education"
- John Wiley & Sons Inc; 2nd Revised edition
- J. S.Chauhan,"Advanced Education Psychology" SumitPrakashan
- J. C. Agrawala (2009), "Essential of educational technology" Vikas Publishing House Pvt Ltd, 01-Nov-2009
- Rizzoli (March 18, 2008);"How to Read A Building"Rizzoli (March 18, 2008); Bruce Joyce,"Models Of Teaching",Pearson; 9 edition (April 14, 2014)
- New Trends in Architecture Education, By- Ashraf Salama

BAR 701 DESIGN – VII

Course Code: BAR 701 Credit Units: 10 L/2-ST/8-P/0 **Teaching hours: 10**

Course Objectives:

- To understand Design constraints pertaining to **specialized high-rise/large span buildings requiring advanced services & structural systems.**
- To investigate design issues pertaining to Specialized buildings
- To create architectural design for specialized buildings

Course Contents:

Module I: Introduction to Specialized Buildings

Introduction to parameters that control design for specialized buildings requiring large span structures or advanced services with examples. Project introduction for studio exercises.

Module II: Case studies, Site Studies and Literature Studies

Case Studies – primary and secondary; Site and surroundings survey- location, local climatic conditions, topography, existing landscape, socio- cultural impact on design; Literature Review – Design Standards and Codes, Comparative Analysis and Area statement

Module III: Concept Formulation

Development of concept to be presented with conceptual block model and sketches for approval.

Module IV: Design Development

Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, integration with advanced structures or services or both, efficiency of design to be worked out and finalized.

Module V: Presentation

Presentation of studies and design proposal through submission of sheet work – drawings and views as well as scaled models. An ***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include projects like high-rise apartments, large span exhibition pavilions, industrial buildings/warehouses, hotels, hospitals, Transportation hubs (Bus Terminal, Railway Stations, Airports, Metro Station etc.)

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.
- Broomer, F. Gerald (1974) Elements of Design: Space, Davis Publications Inc., Worcester, Massachusetts.
- Wagenknecht, Kay and Herte (1989) Site + Sculpture – A collaborated design Process, Van Nostrand Reinhold, NY.
- Allen, Edward and Iano, Joseph (2006), The Architect's Studio Companion: Rules of Thumb for Preliminary Design, Wiley; 4th edition.
- Frederick, Matthew (2007), 101 Things I Learned in Architecture School, The MIT Press.
- Pearson, David (2001), New organic architecture: the breaking wave, University of California Press.
- Fawcett, Peter (2003), Architecture: design notebook, Architectural Press, 2nd edition

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 702 MATERIALS & CONSTRUCTION TECHNOLOGY – VII

Course Code: BAR 702 Credit Units: 03 L/1-T2-P/0 Teaching hours: 03

Course Objective:

- To familiarize student with advance building materials and their construction details. Learning construction details of various building parts at advanced level.

Course Contents:

Module I: Advance material I – 2 weeks

Properties and application of different Glass and glass products: Plain, sheet, plate, textured, laminated, wired and shock resistant glass. Glass blocks, g lass tiles, mirrors, heat reflecting glasses and Glass wool.

Plastics, Nylon, PVC, Bakelite, Polythene, glass fiber reinforced plastic

Module II: Basement construction – 4 weeks

Type-full/semi /2 or more basement floors.

Water proofing material and admixture.

Design and construction detailing of basement

Design and detailing of Basement Ramp, slope, drainage, lighting, ventilators and finishing etc.

Module III: Fast Pace Construction – 4 weeks

Methods, types of construction – beams & slab, waffle grid slab, drop beam and slab, flat slab, lift slab, cast - in-situ service and stair core – cross wall and box frame construction.

Module IV: Elevators and Escalators – 4 weeks

Elevators types and construction detail, Details of lift section, machine room equipment lift well and lift pit. Escalators: types and construction detail, Travellators and other modern modes of vertical movement.

Exercises: field trip and report, preparation of drawings on above topics

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Elements of Structure by Morgan
- Structures in Architecture by Salvadori
- Building Construction by Mackay WB Vol. 1-4
- Construction Technology by Chudley Vol. 1-6

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BAR 703 CONSTRUCTION & PROJECT MANAGEMENT

Course Code: BAR 703 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

- To introduce the students about need of CPM to handle complexity of design & construction; also the role of an architect in effective project management to handle cost overruns, timelines & quality etc.
- To familiarize students with various simple construction planning techniques such as bar charts & networking diagrams.
- To make students familiar with best construction practices, project scheduling & sequencing, equipment's & technologies etc.

Course Contents:

Module I: Introduction - 2 weeks

Defining a Project; Phases involved in Project life cycle i.e. from inception phase to the Post-construction phase, Project Appraisal, Project Delivery Methods, Various stakeholders in construction industry and their roles and responsibilities, Introduction to Project Management Knowledge Areas.

Module II: Construction Planning & Scheduling - 3 weeks

Preparation of Work Break Down Structures and Sequencing of Activities, Resource and Duration Estimating, Preparation of Schedules (using CPM, PERT, Gantt charts, precedence diagrams, etc.),Monitoring and controlling the schedules, Computer Applications for preparing and managing Schedules, Preparation of schedule for completion / submission of deliverables related to their current design exercise.

Module III: Cost &Resource Management - 3 weeks

Functions of Financial or Cost Management, The Concept of Time Value of Money, Techniques of Capital Budgeting, Cash Flow Statement, Preparation of cost baselines and their analysis & Earned Value Management.
Organizing work, staffing, delegation and decentralization, Human resource management, Customer Relationship Management (CRM), & Entrepreneurship Issues in Indian Construction Industry.

Module IV: Quality & Safety Management - 3 weeks

Evolution of Quality Management, quality assurance & control and ISO requirements, Introduction to concept of quality in building design, construction and project management, Tools for Quality Management, Introduction to construction site conditions in India, Impact of safe working environment on HR performance and their productivity, Legal, contractual and other guidelines for construction safety.

Module V: Tendering & Contract Administration - 3 weeks

Types of Tenders & Contracts, Inviting a Tender, Conditions implied on a Tender, Pre-qualification of contractors, Preparation of contract documents, Contract Conditions ,Evaluation of contract bids and Award, Arbitration & Alternative Dispute resolution mechanisms.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- IS 15883: Construction Project Management – Guidelines.
- A Guide to the Project Management Body of Knowledge by Project Management Institute, USA.
- Construction project management: a practical guide to field Construction Management by S. Keoki Sears, Richard Hudson Clough, Glenn A. Sears.
- CPWD, MES, FIDIC, JCT, ADB, World bank, etc.: General & Special conditions of contract and standard operating procedures.
- Contracts and their Management by B. S. Ramaswamy.

Online Resources

- https://www.projectmanager.com/blog
- http://www.smartsheet.com

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BAR 704 HOUSING &TOWN PLANNING

Course Code: BAR 704 **Credit Units: 03** L/1-ST/2-P/0 **Teaching hours: 03**

Course Objectives:

- To Introduce the elementary science of town planning principles
- To familiarize students with evolution and development of town planning through history
- To familiarize the students with various aspects, issues and considerations related to housing design and community planning.

Course Contents:

Module I: Introduction to Town Planning - 3 weeks

Introduction to Human settlements, principles of human settlements in ancient, medieval, modern times. History of Town Planning and Urban design, Concept of Town planning,

Evolution of settlements, form & pattern through historical process of development. Study of various City plan patterns viz; Linear, Radial and Grid Iron layout patterns, New modern ways of Planning, Socio-economic dynamics of urbanization. Industrial revolution and modern city, Garden City, Satellite town, Democratic city. Case studies of some recent planned cities like New Delhi, Canberra, Brazillia, and Chandigarh.

Module II: Planning Process - 2 weeks

Methodology of conducting town planning, surveys and analysis of data collected, use of G.I.S. site planning & urban development, Study of traffic characteristic ; Composition, speed, volume and direction of movement. Urban road systems and geometry, Capacity of roads and intersections, Road network & sections, climate, service & zoning, city scape & street scape.

Module III: Town Planning Theories- 3 weeks

Planning theories of the twentieth century, Current theories on physical planning. Planning theories of Sir Patrick Geddes, Kevin Lynch, Clarence Perry, Frank Lloyd Wright, Ebenezer Howard, Le Corbusier, Soria Y Mata, Lewis Mumford. Study of garden city, radiant city and Utopian concept.Neighborhood planning, elements of neighborhood, definition, formation, need & relationship with the town plan.

Module IV: Planning Standards - 2 weeks

Formulation of planning standards for land use, density, road and various community facilities at the local and town level. Study of Urban development plan formulation & Implementation (UDPFI) guidelines; Detailed understanding of the latest planning and housing acts and other planning regulation

Module V: Introduction to Housing - 2 weeks

Definition of house and housing. Housing and its importance in Architecture; Housing and its relationship with Neighborhood and city plan. Various aspects and issues related to housing.

Type of dwelling structures, Built form, socio-psychological and aesthetic implications and suitability of different types of dwellings, detached, semidetached houses, Flats and multistoried classification according to the type of access-corridor, gallery, direct grouped, combination of these access types. Definition of each of the above types, their suitability, advantages, disadvantages and social, economic and aesthetic implications.Sub- division techniques; proportions of plots and need of roads.Garages and parking areas.

Housing situation in India, Various Govt. programmes

Module VI: Housing Design and Site Planning- 2 weeks

Criteria for site selection and housing layout considerations, Considerations of physical characteristics of site, climate and orientation, Importance of orientation and climatic factors in housing design. Location factors, legal and financial factors, norms and standards for dwelling community and neighborhood factors, shopping, education, health and recreational facilities.

Importance of topography in housing design.Problems inherent in steeply sloping sites, economic and aesthetic implications of the building along and against the contours, silhouette problems on a sloping site.Effects of plantation in the background and front of buildings on a sloping site.conservation of beauty spots, Roads in residential areas.

Any important note or instruction for course coordinator

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Principles and practice of Town and Country Planning, Kebble
- Urban and Regional Planning – A System Approach, J. B. Mcloughin Town Planning in its social context, G. Cherry
- Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century by Peter Geoffrey Hall
- The Development of the Planning Process, J. F. Amos
- Ekistics: An Introduction to the Science of Human Settlements, C. A. Doxiadis Town Planning in Ancient India, BinodeDutt
- Urban Pattern, Arthur B. Gallion
- An Introduction to Housing layouts: Greater London Council
- Housing: J. Macsai.
- Low cost housing in developing countries by G. C. Mathur Laurie Baker by Gautam Bhatia

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BAR 705 ARCHITECTURAL CONSERVATION

Course Code: BAR 705 Credit Units: 02 L/1-T/1-P/0 Teaching hours: 02

Course Objective:

To familiarize the students with various aspects of Architectural Conservation.To understand the role of a conservationist architect.

Course Contents:

Module I: Introduction

Necessity, Values and Ethics, Principles and Scope of architectural conservation.

Module II: Methodology of Conservation

Understanding basic principles of conservation such as (a) Prevention (b) Preservation (c) Conservation (d) Restoration (e) Rehabilitation (f) Reproduction (g) Reconstruction (h) Adaptation

Module III: Structural Aspects of Buildings

Understanding Structural elements: beams, arches, vaults and domes; trusses and frames; piers, columns and foundations etc. accessing their losses and ways to conserve the same for longer life of building.

Module IV: Causes of Decay in Buildings

Natural and human factors; Environmental influences – thermal effect, corrosion and oxidation; Disasters; Botanical and biological causes. Accessing the extent of decay and devising the means to recover.

Module V: Building Repairs

Structural repairs, carpentry; Repairs of plaster work, paint work; Glass and mosaic surface repairs; Repair of excessive moisture etc.Understanding fundamentals of repairs of conservation for different purposes.

Module VI: Professional Practice

Investigation, documentation and analysis and preparation of inspection reports, Preventive maintenance; Legal provisions; Management and phasing, presentation of heritage buildings. Cost estimation and cost control Rehabilitation and adaptive use of buildings.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Conservation of Buildings by J. H. Harvey
- An Introduction to Conservation by B. M. Feildon

References:

- A Critical Bibliography of Building Conservation by J. F. Smith.
- The Conservation of Historical Buildings by B. M. Feildon

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BAR 706 MODULAR CONSTRUCTION TECHNOLOGY

Course Code: BAR 706 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- The course of Modular Construction is aimed at focusing on the study of use of pre-fabrication systems, systems developed by CBRI and other agencies, basic modular planning and the proportioning systems and using the skills in designing of buildings. In today's context when various components of building construction happens off site, it is important to design as per the units/modules, repetition of which gives a modularly coordinated design and helps in easy and fast construction. Thus, the student will be able to demonstrate knowledge of building construction and management with application of Modular coordination and pre-fabrication concepts in their design.

Course Contents:

Module I: Module Orientation to Modular Construction - 1 weeks

Defining the concept of Modular Construction

Introduction to system building, mechanization of production of different parts and components of building types of building sizes.

Review of market to know availability of modular materials

Module II: Advantages & disadvantages of Modular coordination **- 2 weeks**

Classification of prefabrication systems developed CBRI, skeletal system, Brick panel system, non-structural elements, devotions in prefabrication.

Manufacturing of modules and their transport to the site.

Prefabrication; advantages, disadvantages and relevance in Indian context.

Shuttering and construction system for Use of RMC modular spaces and planning coordination requirements.of fixtures and components.

Module III: Modular planning of an interior space**- 2 weeks**

Introduction to modular practice, basic modular planning and component Module, modular number pattern introduction.System of proportion-introduction of various systems and comprehensive industrialized building-introduction and application.

Development of planning Module and structural Modules for various types of buildings in India.

Module IV: Review of works of masters on modular construction such as Le Corbusier etc. and presentation of a report.**- 1 weeks**

Module V: Mivan Shuttering-1 **weeks**

Construction requirements for modular construction design of building as per the availability of interior modular component such as tiles/ kitchen cabinets etc. to avoid wastage. Shuttering and scaffolding requirements. Introduction of 'MIVAN' shuttering system for making multiple housing units and its economics.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Duffy, F, Cave, C, Worthington, J. – Planning office space. Architectural Press, London,1976.
- Duffy, F. – New Office.Conran Octopus, London, 1997.
- Meel, J. V.- The European office: Office design and national context. 010 Publishers, Rotterdam, 2000.
- Harris, D. A. – Planning and designing the office environment. Van Nostrand Reinhold, New York, 1981.
- Neufert P, -NeufertArchitects'Data- Third Edition by Blackwell Science Ltd. Oxford 2000

BAR 707 COLORS

Course Code : BAR 308 **Credit Unit : 02** L/1-T/1-P/0 **Teaching Unit : 02**

Course Objective:

Learning the use of colours in Architecture. Understanding the impact of colours on humanbeing and making its efficient use in architecture, its component and various products being used in buildings.

Course Contents:

Module I:

Study of classification of colours with different hues, values, and shades. Colour composition andproperties. Colour wheel showing primary, secondary & tertiary colours. Chart showing Tints & tones of various colours, Colour combinations

Module II:

Exploring Colour Schemes and its application on Architectural Forms &spaces : Assignment onColour shall be aimed at developing the skills to create Visually pleasing Colour Schemes based on principles of Harmony and Contrast and degree of Chromatism.

Module III :

Colour as an expressive element in architecture emphasize the character of a building and createharmony and unity, or it can be deliberately contrasting to enliven or emphasise. It may affect the way in which people respond to their surroundings and can enhance a mood of calm or elation.

Module IV:

Approaches to colour in architecture and design.The use of colour in architecture More Than JustDecoration.Examples of colour uses by masters and making a report.

Module V :

Color Psychology , Neuropsychological Aspects, Architectural Environments, Visual Ergonomicsand Color. Sociological aspects related to different colours

Exercise: Parallel and angular exterior perspective views of objects of buildings in different colours mediumrendered with appropriate colours showing shades and shadows. Effect of colour in relief compositions.

Students may be advised to use colours in interior and exterior rendering of different type shapes in different type shapes in different mediums to have firsthand experience.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Architectural Rendering Albert &Habe How to paint & draw Jaxtheimer
- COLOR, Environment, & Human Response by Frank H. Mahnke
- Color-Communication in Architectural Space by Meerwein, Rodeck, Mahnke
- The role of colour in architecture by James A M Bell.

BAR 708 BIOCLIMATIC ARCHITECTURE

Course Code: BAR 708 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

The aim of the course is to introduce the students to bio-climatic strategies as an important aspect of sustainable design, to understand in depth the factors affecting thermal comfort and creation of comfort conditions and the building physics associated with it. Aims to introduce concepts of smart and sustainable building design which relates to the respective climatic zone and to provide designers information on how to best to respond to the local climatic context.

Course Contents:

Module I: A global challenge to sustainable development – Climate change

Global, macro and micro level climate, Earth's energy balance, Climate changes – current scenario, International and national context, policy and legislative drivers for adaptation action, Plan Approaches for Sustainable Development and Lower Carbon Strategies, Managing Climate Change Challenges on Development

Module II: Elements of climate and analysis of climatic data

Elements of climate and its quantification, Factors affecting climate, Climatic zones and their characteristics, Implications of climate on building design, Urban climate, Microclimate, Climatic data and its interpretation, Tools for analyzing weather data, climatic aspects of human settlement, Designing an Adaptation Initiative, Tools and Methodologies for Designing an Adaptation Initiative.

Module III: Climate zones and criteria of building design

thermal comfort, heat transfer, thermal insulation and thermal control in buildings - Energy balance of human and built environment, Adaptive model of thermal comfort and its application to sustainable design of buildings. **Sustainable techniques adopted in traditional buildings -** Implementation of climate change adaptation through design and development, building planning and designing – Integrated Sustainable building design Tools for visualizing building energy implications of climates

Module IV: Bio Climatic Design Techniques

Designing for climate change, bio climatic design concepts and techniques – different stages, solar architecture, renewable energy, sustainable architecture, passive and active systems, for cooling heating and lighting, for site planning, building design, landscaping

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Contemporary Processes in Architecture – by Ali Rahim
- Digital Cities AD: Architectural Design – Prof. Neil Leach
- Performative Architecture : Beyond Instrumentality – by BrankoKolarevic
- Versatility and Vicissitude: Performance in Morpho-Ecological Design- by Michael Hensel
- Biosensors for environmental monitoring – by Ursula Bilitewski, Anthony Turner
- Biosensor principles and Application – by LoicJ.Blum, Pierre R.Coulet
- Digital Tectonics – Prof. Neil Leach
- Contemporary techniques in Architecture – by Ali Rahim

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR709 PROFESSIONAL PRESENTATION TECHNIQUES

Course Code: BAR709 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To introduce basis language skills for oral professional communication that enables effective technical and professional conversation.
- To introduce the concept of tonality of the written word as a basic value for selection of terms and their composition in non-spoken forms of professional communication.
- To orient students towards developing skills for an effective communication of his/her ideas, as well as to profess the values and ethics of the design profession especially with regards to interaction with people.
- To help student in developing design portfolio of their own academic projects.

Course Contents:

Module 1:Introduction to Architectural presentation

Definition of an Architectural Presentation; Stakeholders in an Architectural Project; Process of architectural design development and need of communication; Technical meetings; Professional presentation; Various modes of presentation

Module II: Professional Communication I-3 weeks

Dimensions of communication (Formal and Informal, upward, downward etc.; Types of professional communication, Letters, E-mail, Short messages, reports Planning, composing, and writing, Guide to effective writing.

Writing a short Research Paper/ report. This may include reportage of readings, site visits,field trips, conversations with experts and public, etc.

Module III:Professional Communication II-3 weeks

Importance of conversation, definition, process and feedback in communication, cultural influences as barriers to effective communication, features of effective communication . Listening and responding, Modes of one to one communication i.e. personal meetings, video conferencing, etc.; Ethics related to various forms of communications.

Planning and conducting conversations, interviews, preparation and rehearsal of oral statements for presentations, body language, effective listening, and telephonic communication.

Module IV: Introduction to Portfolio Design-5 weeks

Multiple forms of representation, written and visual, students will explore methods that facilitate describing and representing their design work. Understanding relationship between form and content, and more specifically, the understanding of particular modes of representation as different filters through which their work can be read. Recordings of mmaterials, assembly, customization, reproduction techniques; graphic design and composition; The page layout – organization and sequencing of project documentation.The traditional hard copy portfolio and the digital portfolio.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Raman, M. & Sharma, S., Technical Communication : Principles and Practice, 2ndEd. Market, Mike, 2012. Technical Communication
- Rizvi, M. Ashraf, Effective Technical Communication, Anderson, Paul V., Technical Communication : A Reader- Centred Approach, 6 Ed.

BAR710 DESIGN OF LOGO &SIGNAGE'S

Course Code: BAR710 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course objective:

- To acquaint the students with graphic design of symbols, logos and signage
- To familiarize the students towards its application in the field of architecture and built-environment globally

Course contents:

Module I: Introduction

Definition of Graphic design and its specialized industries; History of Visual communication, pivotal movements & designers that led to the development of Graphic Design industry dealing with Symbols, Logos and Signage as witnessed today.

Module II: Visual Design Fundamentals

Visual design elements and principles, theory of graphics and visualization, Colour theory, Typography and Photography;

2D and 3D visual elements for representation and transformations.

Module III: Design Process – Symbols and Logos

Creative thinking processes and methods; Typology fundamentals; designing, narrating and concept evolution for symbols and logos; Designing fundamentals of words, images, aesthetics, identity and expressions; Case Studies of famous examples of Logo and Symbol design;

Module IV: Design Process - Signage

Understanding importance of signage as per the building typologies; impact of commercial signage on users; ergonomics of informative signage; sign regulations, harmony with contextual urban design, architecture and environment, Design process and Case Studies of key informative and commercial signage.

Module V: Technology

Commerical Printing, materials & techniques for signage fabrication and erection, Signage lighting, Use of Graphic design softwares for designing symbols, lgos and signage.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Chris Calori, David Vanden-Eynden, Signage and Wayfinding Design: A Complete Guide to Creating Environmental graphic design system, 2015 wiley
- Lisa Silver, Logo Design that Works: Secrets for Successful Logo Design, 2001, Rockport Publishers
- Michelle Galindo, Signage Design, 2011, Braun
- Edo Smitshuijzen, Signage Design Manual, 2007 Prestel Pub

BAR 801 PRACTICAL TRAINING

Course Code: BAR 801 **Credit Units: 21** L/0-T/0-P/0 **Teaching hours: 00**

Course Objectives:

- The intent of the 'Professional Training' is to make students acquire the practical experience which will concoct them for their likely responsibilities, immediately after qualifying B. Arch. Course.
- Students are expected to learn with the realm of architectural discipline ranging from generation of idea, preparation of drawings to the final execution of design on site.

Course Contents:

At the end of the **7th Semeste**r, and as a part of the Academic Curriculum, the students of the **Bachelor's of Architecture** are required to undergo a compulsory **Practical/Field Training** for a period of **6 Months**.

Module I: Nature of works expected during the training

To the following but not necessarily containing all-

- Preparation of:
  - Sketch designs, presentation drawings etc.
  - Municipal drawings according to the byelaws.
  - Workings drawings and details.
  - Estimates, bill of quantities & specifications.
- Discussions with:
  - Clients
  - Structural Consultants
  - Services Consultants
- Inspection and management of site:
  - Preparation of Models, perspectives and photographs
  - Preparation of Reports, progress charts etc.
  - Other administrative works

Module II: Content of Training Report

Following contents will be followed for both intermediate and final submissions:

After completion of practical training, the trainee is required to submit the following in a hard copy. Training report should contain:

- Office profile
- Listing of current project being undertaken
- Project wise details of work undertaken by student
- Trainee's own assessment and experience about office, working, projects etc.

All projects listed in the report should compulsorily correspond with the list of projects mentioned in the monthly log. Copies of drawing shall be attached as annex to support the content of the report. The drawing prints shall be obtained with the permission of the office and stamped/sealed by the 'Supervisor'/Head of the firm/office.

Assessment:

The Practical/Field Training will be supervised by the faculty from time to time by making regular visits tothe places of the training to get a first-hand feedback about the students' work & discipline etc.Inaddition, the office will be requested to submit a confidential report about discipline/behavior/punctuality, which will be part of marking system.

Submission

At the end of Practical/Field Training each student will submit a portfolio* of his/her work along with theaspects which the student has learnt to enhance his/her professional capability.

The portfolio will be assessed by an internal Jury where each student will be given time to display, present & conclude the experience gained.

***: A portfolio shall include written report, blue print/photocopies of the practical work done and or photographs of the work executed during this period.**

Note: The Practical/Field Training will be organized by the School; however a student will be allowed to chooses a placeof his/her preference for which prior approval of the School will be required.

Examination Scheme:

Components	S	**VIVA**
Weightage (%)	50	50

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BAR 901 DESIGN – VIII

Course Code: BAR 901 **Credit Units: 13** L/2-ST/11-P/0 **Teaching hours: 13**

Course Objectives:

- To understand Architecture as genesis of Urban Design and vice-versa
- To investigate design issues pertaining to Architecture and Urban Design
- To create architectural design intervention for issues of Urban design, Urban development or Urban renewal

Course Contents:

Module I: Introduction to Urban Design concept and Development Regulations

Introduction to urban design concepts and their relation with the Architecture, Understanding of development regulations, Master Plan and other legal restrictions and making presentations.

Module II: Case studies

Students shall visit live site, take photographs, measurements to identify urban design elements, issues and potential design intervention in the selected urban context for design, development or renewal. The Study Shall be presented through sheet work and report.

Module III: Process of urban design

Learning the process of urban design, delineation of the study area, making detailed analysis, mapping the area, identifying the important onsite and offsite elements, heritage structures and working out inferences.

Module IV: Design formulation

Working out the alternative proposals of the area delineated in module III. Preparation of vision statement, analyzing the proposal and working out detailed design providing necessary interventions, Phasing out the development, preparing and comparison of existing situation to the proposed images, possibilities of development.

Module V: Presentation

Presentation of studies and design proposal through submission of sheet work – drawings and views as well as contextual model.***An A4 Design Report - documenting the process & progress of work through clippings of sketches/ photographs of models highlighting design concept as well as the final proposal drawings etc- shall be an essential part of submission.***

Design exercise can include urban development/ redevelopment/renewal schemes -Neighbourhood unit, University campus, riverfronts, Business District Centres, city nodes etc. **The design shall include detailing of one of the main building.**

Examination Scheme:

Components	A	S1	S2	CT	EE	
Weightage (%)	05	15	20	10	20 **Viva**	30 **EE**

Text Books /Reference Books/Journals/Other Study Material:

- **Landscape Design – John O. Simonds**
- **Urban Spaces – Aldo Rossi**
- **Urban Design: The Architecture of Town and Cities, Paul D Spreiregen (1965)– Tata McgrawHill**
- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Chiara JD and Calender, (1983), Time Savers Standards for Building Types, McGraw Hill Book Company, New York.

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR 902 ADVANCED MATERIALS & CONSTRUCTION TECHNOLOGY – VIII

Course Code: BAR 902 Credit Units: 03 L/1-T/2-P/0 Teaching hours: 03

Course Objective:

- Understanding modern building materials and different technology used in construction methods.

Course Contents:

Module I: Introduction to Pre-Fabrication Technology – 3 weeks

Introduction to prefabrication and its relevance in the construction field.Aspects such as – construction terminology, types, Applications, Detailing. Site visits and material collection from Pre-Fabrication manufacturing units and live examples.

Module II: Introduction to Pre-Stressed Technology and large span construction– 3 weeks

Introduction to the topic and its relevance in the construction field.Aspects such as – construction terminology, types, Applications, Detailing. Site visits and material collection from Pre-Stressed manufacturing units and live examples.

Module III: Advanced Glazing systems – 3 weeks

Structural use of glass such as Curtain wall –Design, detailing and specifications, Staircase and railing in glass-details of junction fixing etc.Market survey of available materials, technology and hardware.

Module IV: Advanced Architectural details – 3 weeks

Advance details of grooves, beading and patterns in furniture and fixtures and their continuity, understanding the use of modern fixtures and hinges as applied to various building material. Students shall prepare details of some of works done by them in the previous years.

Module V: Advance use of metals – 3 weeks
Miscellaneous metals such as copper, stainless steel etc. and their advanced application in buildings such as cladding, piping etc along with their detailing of their construction and joints.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building Construction – Materials by M.V. Naik Strength of Materials – Khurmi R. S.
- Applied Mechanics and Strength of Materials – Khurmi R. S. Civil Engineering Handbook – P.N. Khanna
- R.C.C. Design – Khurmi, Punmia, Sushil Kumar Design of Steel Structure – Negi
- Structure in Architecture – Salvadori and Heller

References:

- Elements of Structure by Morgan
- Structures in Architecture by Salvadori
- Building Construction by Mackay WB Vol. 1-4 Construction Technology by Chudley Vol. 1-6 Elementary Building Construction by Mitchell Structure and Fabric by Everet

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BAR 903 DISSERTATION

Course Code: BAR 903 **Credit Units: 06** L/2-T/4-P/0**Teaching hours: 06**

Course Objectives:

- To make students able to integrate learning of all previous semesters to establish a research component in architecture that preferably should also lead to contribute in their architecture thesis in final project.
- To acquaint students with appropriate tools & methodologies of research in architecture.

Course Contents:

Module I: Introduction - 2 weeks

Introduction to the dissertation project and get the project/ topic approved by the review committee/faculties giving suitable justifications and reasons for the research. The proposal of research should include the aims, objectives, methodology, limitations, bibliography, site etc. at the time of approval of topic.

Module II: Data Collection (Case Studies)- 3 weeks

Selection of appropriate case studies, conducting the case studies, analyzing site and surroundings ,user behavior and requirements utility and space enhancements, form and function, topography, existing landscape, micro & macro climate, structure, Site and surroundings survey, impact of socio economic & cultural behavior of users on design etc.

Module III: Data Analysis - 3 weeks

Research analysis of collected data, Review & Justification of topic selected, Detailed study of functions, Study of relationships between built and open spaces, interlinking of various activities.

Module IV: Compilation - 3 weeks

Compilation of data collected & analyzed in previous modules in suitable manner to yield tangible or intangible outcomes of study.

Module V: Presentation - 3 weeks

For final review & presentation; preparation of a report having suitable illustrations/sketches/texts etc. in prescribed format provided by the faculty/committee.

Examination Scheme:

Components	A	C	S	TP	VIVA
Weightage (%)	05	25	20	30	20

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.
- Groat, L. & Wang, D., 2002. Architectural Research Methods. New York: John Wiley publication
- Ching, F. D. K., 1979. Architecture: Form, Space and Order. New York: Van Nostrand Reinhold Company.
- Neufert, E., 1970. Architect's Data. London: Crosby Lockwood and Sons.
- Site Planning Standards, J. D. Chaiara.

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com
- https://www.**architecture**.com/knowledge-and-**resources**/**resources**-landing-page

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BAR904 LIGHT AND ARCHITECTURE

Course Code: BAR 904 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

The primary focus of this course is the study of natural and Artificial lighting in an architectural context. The course promotes the integration of occupant comfort, energy efficiency and daylight availability throughout the design process and places an emphasis upon the role light can play in shaping architecture.

Course Contents:

Module I: Introduction to Daylighting- 3 weeks

Introduction: Physics of light, Photometry, Transmission of light, recommended illuminances, Glare, Daylight illuminance, Luminance distribution, Design methods, Total flux method, Daylight factor method, BIS method, Pepper–pot diagram, Models and computer tools. Planning for daylight, day light utilization factor.,Indoor and outdoor daylighting light,

Lab: Introduction to Lux meter. Simple experiments to measure Lux levels under different sky conditions, Class room lux measurements, etc.

Module II: Introduction to Artificial Lighting- 2 weeks

Study of interior lighting, different types of lighting their effects types of lighting Fixtures. Controls system , SOLAR control with artificial lighting, Artificial sky, Computer modelling.

Module III: Elements of Interior Architecture – lighting accessories- 2 weeks

Study of interior lighting, different types of lighting their effects types of lighting Fixtures.

Module IV: Philosophy of Lighting in Architecture - 3 weeks

The physiology of vision:The eye and sight (visual perception), Temporal sensitivity of vision,The spatial perception of the human eye,Visual comfort,Biological effects of lighting,The perception of light in architecture. Exhibiting philosophy,Lighting Legislation

Module V: Application of lighting and illumination in Architecture with Case Studies- 4 weeks

Designing using light as an architectural element,Necessity of lighting in designing spaces,Concept of Architectural Lighting, Phases of lighting design- Pre and post Analysis, Architectural lighting design focuses on fundamental aspects of the illumination of buildings-In aesthetic appeal,The functional aspects, Energy efficiency and wastage of light, Emphasis on Architectural features, Layout and Pattern,innovative daylighting systems,the future of daylighting and artificial lighting. Case Studies-Residential,Education,Ecclesiastical,Leisure,Transport, Display,Industrial.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Architectural Lighting by M. David Egan, Victor W. Olgyay
- Gordon, Gary; Interior Lighting for Designers; Wiley Publishing, 2003
- Flynn, John; Seegil, Arthur; Steffy, Gary; Architectural Interior Systems: Lighitng/Acoustic/Air Conditioning; Van Nostrand Reinhold,
- Karlen, Mark; Benya, James; Lighting Design Basics; Wiley Publishing, 2004
- Russell, Sage; The Architecture of Light; ConceptNine, La Jolla, 2008.
- Schiler, Marc; Simplified Design of Building Lighting, Wiley, 1998, Steffey, Gary; Architectural Lighting Design, Wiley, 2008
- Lam, W. M. C. (1986). Sun-lighting as Form-giver for Architecture. New York : Van Nostrand Reinhold

Online Resources

- https://www.academia.edu/35571106/_Architecture_Ebook_Daylighting_-_Natural_Light_in_Architecture?auto=download
- https://books.google.co.in/books/about/Lighting_Historic_Buildings.html?id=Jk8ckqj6b7sC&redir_esc=y

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BAR 905 INTELLIGENT INTERIORS

Course Code: BAR 905 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

Technology is becoming inherent part of modern life and has invaded every aspect of our life including the building interiors. Intelligent interiors are one of the most important parts of the modern buildings and objectives of the course is to make students aware of the use of technology in interiors.

Course Contents:

Module I: Introduction - 2 weeks

Overview of intelligent interiors and use of electronics & IT equipment for creating interesting interiors.

Module II: Intelligent Safety Systems - 3 weeks

Use of technology to maximize the performance of fire alarms and security systems while at the same time minimizing costs.Incorporation of safety equipment such as CCTV etc aesthetically in the interiors.

Module III: Workplace automation - 2 weeks

Intelligence with respect to workplace automation in an intelligent interior consists of the use of high – tech office automation systems to render the operation of a company more efficient. This can be done at a reduced cost to tenants by virtue of the equipment being shared.

Module IV: Automation of interiors - 2 weeks

Remote control in interiors, Managing and monitoring building efficiency from distance.Managing Security, HVAC etc from distance.

Module V: Virtual spaces and interiors - 3 weeks

Learning ways & system of creating such spaces that change shape/ size/ ambience/ colour etc. to change according to performance & suite the audience- D/4D/6D interiors.Interiors to suit the model & behavior of the user.Right from ones entry to the building to reach his final destinations. Temperature, light and colour control.

Module VI: Intelligent use of energy - 2 weeks

Intelligent interiors consist of energy use to the minimum with computerized system. To control light, airflow, air-conditioning, outdoor light entering the building heating and minimizing the energy consumption.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text

- 'Drywall (Pro Tips for Hanging & Finishing), John D. Wagner
- Graphic Interiors (Space Designed by Graphic Artists), Corina
- Dean Interior design illustrated , Francis D.K. Ching
- Graphic Interiors (Space Designed by Graphic Artists), Corina Dean

Reference Books

- A.J. Metric Handbook, Jan Bilwa and Leslie Fair weather Architectural Graphic standards, Boaz Joseph
- The Curtain Book, MitchllBeazlty
- Illustration + Perspectives (In Pantone Colors), EijiMitooka

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BAR 906 DISASTER RESISTANT ARCHITECTURE

Course Code: BAR 906 Credit Units: 02L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

- To familiarize the students to the various theoretical and practical aspects of disasters and explain them the precautions to be taken in design resistant structures.
- To introduce the disaster management techniques and method of rehabilitation
- To make them understand the concept of shelter housing, etc.

Course Contents:

Module I: Introduction - 2 weeks

Overview of disasters; major natural disaster – flood, cyclone, droughts, landslide, heat waves, earthquakes, fire hazards etc. and their importance to architects.

Module II: Factors Causing Earthquake - 3 weeks

Module content Basic understanding on fragile eco-system, physiographic and geo-chemical data mapping, soil and topography, hydrological factors, climatic conditions. Site planning, building form and shape, considerations for earthquake resistant buildings

Module III: Strategies for Disaster Prevention- 3 weeks

Engineering, architectural, landscaping and planning solutions for different types of calamities. Norms, standard practice procedures for shelter and settlement

Module IV: Fire Safety in Buildings - 3 weeks

Understanding Fire. Learning precautions for fire resistant buildings, Designing the fire resistant building using modern construction techniques and materials, Fire safety in multistoried buildings.

Module V: Laws Related to Disasters- 3 weeks

Fire related Laws for buildings, Earthquake related laws, provisions in NBC and other standards laid down by Bureau of Indian Standards

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Dynamics of Structures by A. K. Chopra
- Building Configuration and Seismic Design, C. Arnold and R. Reitherman
- Earthquakes An Architect's Guide to Non-Structural Seismic Hazard, H. J. Lagorio
- Handbooks by IIT Kanpur for Earthquake Design.
- The Seismic Design Handbook, F. Naeim
- Design for Earthquakes, J. Ambrose and D. Vergun

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BAR 907 TENSILE CONSTRUCTION

Course Code: BAR 907 **Credit Units: 02** L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

- To demonstrate how tension structures, expand the boundaries of form and function while educating you on the process of their development from concept to completion.

Course Contents:

Module I:Introduction to tensile constructions-2 weeks

The theme and concept of the tensile construction shall be introduced to give the background from the temporary to permanent tensile structures.

Module II:Tensile Shapes and Structures-3 weeks

The creative challenge to designers is to explore the development of striking new forms, which satisfy the structural requirements of the membranes surface. Developing new shapes of push-up elements, and varying the design of the perimeter connections enables dramatic variation in the appearance of a structure.so, this can be done by learning Stress – strain diagram in simple tension, perfectly elastic, Rigid – Perfectly plastic, Linear work – hardening, Elastic Perfectly plastic, Elastic Linear work hardening materials, Failure theories, yield conditions.

Module III:Materials for Tensile Structure-3 weeks

The ability of fabric to form double curvature surfaces and its inherent translucency has always been attractive for designers. But with the advent of computer form finding and the development of reliable structural fabrics the world of tensile structures took a giant leap forward this will also lead to know and design different other kinds of material used for such structure.

Module IV:Tensile Structure for Indoors and Outdoors Spaces-3 weeks

This is to understand the various use of tensile in outdoors as well as in indoors for space designing and also develop an effective means and method of its design, installation, and use.

Module IV: Model Making in Tensile Structure-2 weeks

One common issue is that tensile are difficult to draw and harder still for the client to visualize to solve this we need to resolve this by the help of models.

The traditional way around this was to create a physical model (using a curious combination of foamboard, timber dowels and ladies' tights). Now we have a whole range of CAD programs such as 'Rhino Membrane'* that can give designers the tools for the job.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Timoshenko &Goodier, "Theory of Elasticity", McGraw Hill.
- Srinath L.S. (1994), Advanced Mechanics of Solids, 10th print, Tata McGraw Hill Publishing company, New Delhi,
- Sadhu Singh, "Theory of Elasticity", Khanna Publishers.

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BAR908 INTERIOR DESIGN

Course Code: BAR 908CreditUnits: 02 L/1-ST/1-P/0 **Teaching hours: 02**

Course Objectives:

To study the Interior Design principles and their applications in interiors, and to foster creative ability and inculcate skills to understand and conceive architectural design.

Course Contents:

Module I: Introduction to Interior Architectural Design -2 weeks

Definition of interior design, Interior architectural design process, vocabulary of design in terms of principles and elements, Introduction to the design of interior spaces as related to typologies and functions, themes and concepts - Study and design.

Module II: History of Interior Architectural Design-3 weeks

Brief study of the history of interior architectural design through the ages relating to historical context, design movements and ideas etc.Brief study of folk arts and crafts. (vernacular design in India) with reference to interior design and decoration.

Module III: Elements of Interior Architecture - Enclosing Elements-3 weeks

Introduction to various elements of interiors like floors, ceilings, walls, staircases, openings, interior service elements, incidental elements etc., and various methods of their treatment involving use of materials and methods of construction in order to obtain certain specific functional, aesthetic and psychological effects.

Module IV: Elements of Interior Architecture – lighting accessories & interior landscaping-3 weeks

Study of interior lighting, different types of lighting their effects types of lighting fixtures. Other elements of interiors like accessories used for enhancement of interiors, paintings, objects-de-art, etc. Interior landscaping, elements like rocks, plants, water, flowers, fountains, paving, artifacts, etc. their physical properties, effects on spaces and design values.

Module V: Elements of Interior Architecture - Space Programming-3 weeks

Study of the relationship between furniture and spaces, human movements & furniture design as related to human comfort.Function, materials and methods of construction, changing trends and lifestyles, innovations and design ideas. Study on furniture for specific types of interiors like office furniture, children's furniture, residential furniture, display systems, etc. Design Projects on Residential, Commercial and Office Interiors.

Any important note or instruction for course coordinator

.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Ching, F. D. K. (1987). Interior Design Illustrated. New York : V.N.R. Publications.
- Doshi, S. (Ed.) (1982). The Impulse to adorn - Studies in traditional Indian Architecture. Marg Publications.
- Kathryn, B. H. and Marcus, G. H. (1993). Landmarks of twentieth Century Design. Abbey Ville Press.
- Penero, J. and Zelnik, M. (1979). Human Dimension and Interior space: A Source Book of Design Reference Standards. New York : Whitney Library of Design
- Slesin, S. and Ceiff, S. (1990). Indian Style. New York : Clarkson N. Potter.
- Dorothy, S-D., Kness, D. M., Logan, K. C. and Laura, S. (1983). Introduction to Interior Design. Michigan : Macmillan Publishing.

BAR 909SET DESIGN

Course Code: BAR 909CreditUnits: 02 L/1-ST/1-P/0 Teaching hours: 02

Course Objectives:

Set Design is an important and interesting section of design industry as it gives shape to ones' imagination and visualization. Set designing intends to expose students to different backgrounds and enhance designing skills by expressing ones' visualization into scenes. In this, students will be able to explore a new arena of employment

Course Contents:

Module I: Orientation to the Set design

Introduction to set design, History of set designing, Materials and techniques, In sync of traditional set designing to contemporary sets. Case studies of classical & modern sets as submission of reports.

Module II: Application of set design

Practical use of Elements and principles of design in set Design, Presentation on different Film studios such as Ramoji film city, and Universal Studio/AUR Studio etc.

Module III: Workshop

Designing sets by using local low cost materials, designing artistic backdrops for various events held in college/ Students in groups designing sets such as News reports office, café.

Module IV :Virtual sets

Adoption of technology in design of sets, virtual sets. Incorporation of multimedia & modern gadgets within sets.

Module V :Modern set

Study of modern set, requirements for stage shows for different activities such as dances/ dramas/ plays/ solo and group performances/ reality shows/ discussion stage/ mobile & reusable stages.Understanding the equipments required and that aesthetic incorporation to enhance viewer pleasure.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Drafting for the theatre- Dennis Dorn and Mark Shanda
- Light Fantastic: The Art and Design of Stage Lighting- Max Keller
- The Handbook of Set Design- Crowood Press
- Set Design by Tony Davis

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BAR 1001 ARCHITECTURAL THESIS PROJECT

Course Code: BAR 1001 **Credit Units: 16** L/6-ST/10-P/0 **Teaching hours: 16**

Course Objectives:

- To provide the students an opportunity to research and develop a design scheme for a project of their choice and approved by the school maintaining professional working standards and attain a professional level approach with extensive details.
- To attain independent professional approach analysis based design projects achieving high level of workability, efficiency and aesthetics in 3-D form with all the services properly worked out in a way as a professional office worksfor getting a competition project.

Course Contents:

Module I: Introduction

Introduction to the thesis design and get the project approved with the finalization of thesis guide/s. (Consent to be taken from internal and external guide both). The **Synopsis** should include the followings:

Justification to topic selected	Aim and Objective of Project	Project Information
Methodology of research	Identified and selected Case studies	Limitation and scope of Research and Design

Module II: Research

Extensive research specific to project conducted through the primary and secondary data collection. Conduct the case studies with extensive study and analyze (comparative) to comprehend the existing prototypes. Detailed site study to grasp site peculiarities to enable contextual design. Conclude Design Criteria to form basis for Concept Development. Finalize the Project Brief and Area Statement based on Conclusions. Presentation of compilation of Research data and conclusions drawn in the form of A4 Report.

Module III: Concept Development and Designing

Development of concept based on Design criteria and Area statement brief concluded in previous module to be presented with conceptual model and 3-D sketches. Design to be developed through a series of appraisals and open discussions. Planning at site as well as building level to be frozen and workability, efficiency of design to be worked out and finalized.

Module IV: Specifications and Estimation

The project estimation with all the necessary specifications to be detailed to reflect the cost of the project. The details should include all the interior and exterior details.

Module V: Presentation

Complete project development and analysis to be compiled Thesis Report (Final) containing all the details of the project. VIVA-presentation on 3-D drawings and detailed Model of the Project. Mode of presentation may be mutually devised by co-coordinators and student that may be project specific.

Examination Scheme:

Components	**A**	**P**	**S**	**EE**	
Weightage (%)	05	25	20	20 **Viva**	30 **EE**

The thesis project to be evaluated through open jury comprise of thesis guide and external expert members.

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Site Planning Standards, J. D. Chaiara.
- Time Saver Standards, J. H. Callender and J. D. Chaiara
- Architectural Graphic Standards, C. G. Ramsey
- Neufert's Architects Data, V. Jones, Ed. Gen.
- Towards a Human Architecture, A. Bruce
- Architectural Graphics: C. Leslie Martin
- Perspective for the Architect: Themes and Hudson
- Interior Design: Ahmed Kasu
- Architectural Graphics – Ching Frank
- Engineering Drawing – P.S. Gill

References:

- Form and Structure, D. Philip and O. Frei
- Architectural Graphic standards editor – Boaz Joseph
- Planning – the Architect's handbook, E and E.O.
- Time Saver standards for building types, Editor Joseph D.C. and John Callender.
- Practical Plane and Solid Geometry – H. Joseph and Morris
- Architectural Thesis done by other people

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 1002 PROFESSIONAL PRACTICE & MANAGEMENT

Course Code: BAR 1002 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

- To make students gain substantial knowledge about various norms,rules,codesetc controlling the profession of architecture particularly in Indian context.
- To make the students understand the professional intricacies, professional responsibilities and conduct, legal obligations and implications so that at the end of their studies the Students is familiar of their responsibilities as an architect.
- To equip students to face the challenges of contemporary, professional practice and to have the skills to become reflective practitioners.

Course Contents:

Module I: Introduction toProfessional Bodies - 2 weeks

Familiarization with different national & international Professional Bodies directly and in-directly controlling the architecture profession such as The Indian Institute of Architects (IIA), The Council of Architecture (COA), The Indian Institute of Interior Designers (IIID), International Union of Architects (UIA), The Institute of Town Planners India (ITPI) & other key bodies.

Module II: Council of Architecture; Architect's Act of 1972 - 3 weeks

Detailed study of the Act, different clauses and their vitality. The Council of Architecture- its formation procedure, functions role and responsibilities, members of the council, rules and regulations of the COA. Minimum Standards of Architectural Education as set up by the COA.

Module III: Council of Architecture - Professional Conduct & professional charges - 3 weeks

Rules & acts as laid down bythe COA with addendums. Procedures that an architect must adhered to for keeping a legal as well as ethical practice. Awareness about Architectural Competitions and the Procedure lay down by the COA. Does and Don'ts for Architectural Competitions.

Module IV: Indian Institute of Architects (IIA) - 3 weeks

Introduction to IIA & its formative History, Its bye laws, rules and regulations, membershipprocedure and categories, IIA Elections, Functions and formation of the IIA Council, Importance of IIA, Activities of IIA and Awards by IIA.

Module V: Setting up Architecture Practice & Office Management -3 weeks

Architectural practice and office, Work Structure of office, Client management, Human Resource management, Financial management, Contracts and tenders and Fee Structure

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- COA documents.:Architect's Act 1972;
- Architectural Practice in India – Prof. MadhavDeobhakta Construction Project Management – K.K. Chilkar

Online Resources

- https://www.coa.org
- www.indianinstituteofarchitects.com

*Manuscript based on Presentation, Discussions and Minutes of Meeting of 8th B.O.S. held on 05.12.2018

BAR 1003 PRODUCT DESIGN

Course Code: BAR 1003 Credit Units: 02 L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

To expose the students to the various theoretical and practical aspects of ergonomics and productdesign

Course Contents:

Module I: Ergonomics

Definition of human factors, Application of human factors data, Human activities – their nature and effects, man-machine system and physical environment.

Module II: Human control system

human performance and system reliability, information input and processing, , visual display, visual discrimination, Alphanumeric and related displays, visual codes and symbols, Auditory, tactual and olfactory mechanism, applied anthropometric, physical space and arrangement.

Module III: Product Design

Form, colour, symbols, user specific criteria; material, technology and recyclability; packaging; multiple utility oriented approach to product design; design of household elements, tools and devices; element design for the physically and mentally repaired. Creative thinking –creativity and problem solving- creative thinking methods- generating design concepts-systematic methods for designing – functional decomposition – physical decomposition – functional representation –morphological methods-TRIZ- axiomatic design

Module IV: Product Design Applications

Design Definitions and Design Spectrum, Product Attributes – Function and Emotion, Product configurations and Component relationships, Product Analysis – Diachronic, Synchronic, Understanding and Analyzing contexts, parallel situations, future situations, Understanding modularity and modular systems, 3D lattice and structures, Design of Modular System ,abstract design, Process of conception and its documentation. Identifying customer needs,voice of customer,customerpopulations,hierarchy of human needs,need gathering methods – affinity diagrams – needs importance-establishing Product Design characteristics-competitive benchmarking- quality function deployment- house of quality-product design specification-case studies

Module V: Industrial application of Product Design

Industrial Product design, human factors design, user friendly design, design for serviceability, design for environment, prototyping and testing, cost evaluation, categories of cost, overhead costs, activity based costing methods of developing cost estimates, manufacturing cost, value analysis in costing

Exercise : Hands on Workshops on Product Design Studio, Case Studies on Product Design Development and ValueEngineering

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- A-Level Product Design, Will Potts
- Materials and Design: The Art and Science of Material Selection in Product Design, Michael Ashby, Kara Johnson Human Factors in Product Design, W.S. Green
- Product Design: Graphics with Materials Technology, Lesley Cresswell

References:

- Creativity in Product Innovation, Jacob Goldenberg, David Mazursky Building Product Models, Charles M. Eastman
- Building Better Products with Finite Element Analysis, Vince Adams, AbrahamAskenazi

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BAR 1004 COST EFFECTIVE ARCHITECTURE

Course Code: BAR 1004 Credit Units: 02L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

To familiarize the student with cost-effective construction for building economy. Todevelop an understanding of different issues, types and techniques involved in the design and construction of low cost structures

Course Contents:

Module I: Introduction

Basic shelter issues in India and Affordability, Need for achieving low costs in building construction – Low cost vs. Quality. Factors constituting building costs, Controlling parameters for achieving Cost Effective Architecture – land, space, materials, design, construction techniques, construction time &labour.

Module II: Understanding needs of economically weaker sections

Cultural study of economically weaker sections in India in different pockets like slums & existing EWS & LIG housings, space usage pattern studies, study for modifications and alterations done by dwellers in existing EWS & LIG Schemes.

Module III: Architectural Planning & Design for Cost Effective Architecture – Space Optimization

Site planning and Architectural Design as tools for Cost Effective Architecture, Space planning Norms of National Building Code, India for Economically weaker Sections in Urban and Rural Areas; National building organization – Recommendation of Housing and Urban Development Corporation, Space optimization as a process of cost reduction, Multiple use of space. Multiple use of furniture.

Module IV: Building Materials, Construction techniques & Time Optimization for Cost Effective Architecture

Local materials and traditional technologies, Improved traditional technologies, Innovative Materials and construction methods developed Laurie baker; CBRI Roorkee, HUDCO, Anangpur Building Centre, Development Alternatives, Auroville Building Centre and many others for different types of walling, roofing and foundation with materials like Pressed soil blocks, soil cement blocks and other alternative materials – fly ash brick, gypsum byproducts, Ferro cement products, bamboo, jute stalk etc; Ways to cut down the use of unwanted building materials, Project time optimization to reduce project costs, Use of effective project management techniques.

Module V: Studies and Comparative Analysis for Cost Effectiveness

Case studies presentations of low cost/ cost effective projects and their comparative cost analysis with conventional projects.

Examination Scheme:

Components	A	CE	CT	EE
Weight age (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Alternative Construction, Contemporary Natural building Methods: Edited by Lynne Elizabeth and CassandrAdams.
- Low cost housing in developing countries by G. C. Mathur
- How the other half builds – Vol 1, 2 & 3 by Vikram Bhatt et al.
- National Building Code of India, 2005 – PART 3 – ANNEX C, E & F Laurie Baker – Life, work, writings by Gautam Bhatia
- Low Cost Housing – An analytical Study of the current practices & techniques by VastuShilpa Foundation
- CBRI Publications – Book 1-9
- Low Cost Housing competitions 1974 – 96 by HUDCO How to reduce building costs by Laurie Baker

BAR1005GEOGRAPHICAL INFORMATION SYSTEM

Course Code: BAR1005 Credit Units: 02L/1-T/1-P/0 **Teaching hours: 02**

Course Objectives:

To develop an understanding of the land and its designed modifications, with an integration of Earth sciences. To develop understanding and capacity building to use information science in architecture to address various problems of geography, cartography, geosciences and related branches of science and engineering in design and planning.

Course Contents:

Module I: Introduction of Remote Sensing - 2 weeks

Concept and Foundation of Remote Sensing, Elements of Photographic System Types of Aerial Photographs: Vertical Photographs, Oblique Photographs, Satellite Imagery

Module II: Introduction of Photogrammetry - 2 weeks

Introduction to Air Photo Interpretation, Photogrammetry for Map Making :Introduction /Definition, Geometric Elements of a Vertical Photograph, Relief Displacement, Ground Control for Aerial Photography

Module III: Introduction of Geographical Information System - 2 weeks

Geographical Information Systems: Definition, Composition of Geographical Information System, Computer Hardware Module, GIS Software Module, Data Input, Data Storage, Data Output, Database Structures

Module IV: Digital Image Processing and Applications - 3 weeks

Geoprocessing Tools, Digital Image Processing, Applications: Geological & Soil mapping, Land-use / land cover Mapping , Land use Classification, Agriculture Applications, Forestry Applications, Water resource Applications: Water Pollution Detection, Flood Damage Estimation, Architectural Applications, Wetland mapping

Module V: GIS Data Analysis and Modeling - 3 weeks

Application of GIS & Remote Sensing, Automated Mapping / Facility Management. (AM/FM), 3-D GIS Digital Elevation Model & Digital Terrain Model, Digital Image Processing and Editing; Error Detection and Correction, Geo Spatial Analysis: Turning Data into Meaningful information. Comparison of Vector & Raster Methods, Internal G.I.S., Network Analysis, Open GIS.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

Text:

- Batty, D.M.a.M. (ed.) (2005) GIS, Spatial Analysis and Modeling, ESRI Press.
- Brewer, C.A. (n.d) Designing Better Maps: A Guide for GIS Users, ESRI Press.
- C, H.T. (n.d) Land Form Designs, P D A Publication.
- C.Hanna, K. (1999) GIS for Landscape Architects, ESRI press.
- G.S.Srivastava (2014) An Introduction to Geoinformatics, McGraw Hill Education.
- Garcia, J. (2017) Introduction to Geographic Information System, Larsen and Keller Education.
- H, P.P. (1995) Concrete Floors Finishes , Butterworth-Heinemann.

References:

- K.R, B. (1990) Integrating GIS into Urban Regional Planning, Alternative approaches for developing countries regional development Dialogue , Japan: UNCRD.
- Michael, L. (1988) Tree Detailing , London: Butterworth Architecture.
- Michael, L. (1993) Landscape Detailing Vol.1 Enclosure , 3rd edition, Architectural Press.

Online Resources

- https://www.researchgate.net/publication/297049548_A_Tutorial_on_Geographic_Information_Systems_A_ten-year_update
- https://www.manage.gov.in/studymaterial/GIS.pdf
- https://unstats.un.org/unsd/publication/SeriesF/SeriesF_79E.pdf

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BAR 1006 ARCHITECTURE JOURNALISM

Course Code: BAR 1006 Credit Units: 02L/1-T/1-P/0 Teaching hours: 02

Course Objectives:

- Architectural Journalism aims to provide foundations for writing about architecture and design.
- This course deals with the basics of news writing, news structure, editing and presenting and discusses the elements and principals of writing.
- This course is intended to help those, who have inclination for writing to develop their skills to enable then to record, analyze and evaluate architecture both in its theoretical and practical forms.
- To understand the process of documenting a projects in the field of architecture.

Course Contents:

Module I: Introduction - 2 weeks

Journalism in general, Theories of journalism, Techniques and processes, Contemporary Architectural journalism

Module II: Basics of writing - 3 weeks

News – Source, Elements, News Values and Impact, Journalism – History, Focus on India, Journalism and SocietyNews Writing – Style and principals. Types of leads & Body text, News Structure – 5W 1H, Inverted Pyramid, Diamond and Hourglass style of news writing, Understanding your reader, Writing in perception of the user, Career in Architectural journalism.

Module III: Writing about design & architecture - 3 weeks

Overview of journalistic assignments. Design – Analysis and Writing, Writing review and critical analysis, Collecting information and presenting data, Elements of architecture: the form, the materials, the design concept or the key planning – Idea Creation, Documenting of projects, Brining Flair and Objectivity in Writing, Architectural Criticism, Writing on interior and construction, Writing on urban planning and sustainability, Interview and Personal Writing, Writing facts and establishing debate, Corporate Reporting, Press Meeting and press releases.

Module IV: Editing & Presentation - 3 weeks

Prof reading techniques – Languages, Grammar and Style, Electronic Copyediting, Writing Headlines and captionsWriting an editorial and opinion , Style sheet, Constructing Narrative , Writing for various media – Print, Visual and Online, Lay-out – Newspaper and Magazine, Introduction to Publishing Softwares.

ModuleV: Magazine Writing - 3 weeks

Introduction to magazine journalism and writing, Reviews of famous architectural magazine and writers, Principals of writing magazine story, Feature writing , Using pictures and graphics,

Project : Student must prepare two features; one for newspaper and other for the magazine about a project and anarchitect

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Miller, Randy & Wilber, Rick (2002). Modern Media Writing.
- Wadsworth Publishing Sharma, Sangeet (2013). Architecture, Life & Me. Rupa& Co. Delhi.
- Wray, Cheryl (1997). Writing for Magazines: A Beginner's Guide. McGraw Hill.
- Architectural Criticism and Journalism by Majd Musa and Mohammad Al-Asad (1 March 2007)
- Challenges to the Epistemology of Journalism: The Architecture of the Contemporary Mediascape (Economy and Society... by George Lazaroiu (15 August 2012)

Magazines

- Metropolis Magazine,
- architecture and design
- Plan, architecture, design,
- art and urban planning, Surface Magazine,
- architecture, design, and fashion

BAR 1007 BUILDING ECONOMICS AND LEGISLATION

Course Code: BAR 1007 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To understand Architectural projects as an economic function and understanding their evaluation techniques.
- To help the students for understand the concept of building economics behavior and legislation of buildings with emphasis laid on the principles of various costs & economic performance of building.

Course Contents:

Module I:Introduction to Building Economics-2 weeks

Concepts of economics: Utility, Demand & Supply, Wants, Cost, Value, Price, Micro and Macro Economics. Meaning and scope of Building Economics.

Module II:Project Costing and Benefits of Building-2 weeks

Elements of cost components, initial costing, future costing, different types of costs and their impact on building projects.Monetary and non-monetary benefits of buildings.

Module III:Economics Performance of Building -2 weeks

Types of economic performance; accounting for risks & uncertainty; techniques of performance analysis; cost benefit analysis, incremental analysis, bread-even analysis; life cycle cost analysis, rate of return analysis.

Module IV:Value Engineering and Feasibility Analysis-3 weeks

Concept, application to architectural projects, Real Estimate PRO-FORMA Analysis.Concept and types of feasibility, feasibility analysis.

Module V:Legislation-3 weeks

Definition, Resources scheduling and levelling.Labour welfare, applicable labour legislation- nature and scope – Indian constitution and labour – labour laws for the building Industry – laws regulating wages and payments to workers – social security laws – industrial relations laws – miscellaneous laws - Industrial relations and trade unions

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Building Economics for Architects, Thorbjoern Mann
- The Economics of Building: A Practical Guide for the Design Professional, Robert E. Johnson
- Design and Construction: Building in Value, Rick Best, Gerard de Valence
- Best Value in Construction, Kelly.
- Design and the Economics of Construction, D.D. Jaggar, R. Morton.

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BAR1008 BUILDING INFORMATION MANAGEMENT

Course Code: BAR 1008 **Credit Units: 02** L/1-T/1-P/0 **Teaching hours: 02**

Course Contents:

Course Objectives:

- To introduce students about the technology of 'Building Information modelling'.
- To discuss the Roles and Impacts of BIM in the Design, Construction Engineering and Management, Infrastructure Engineering.
- To understand application of various tools of BIM in clash detection, scheduling, estimation & all phases of construction.

Course Contents:

Module I: Introduction - 1 week

Introducing students the technology of Building Information modelling, explaining students its requirements & benefits in construction industry, life cycle, work flow & familiarizing with different application tools for various phases of project.

Module II: Construction Scheduling & 4D Simulation - 4 weeks

Module to focus explaining students on how to accommodate/integrate needs of schedulers/estimators in the modeling process – students should be demonstrated with the do's and do not's of estimation, scheduling and construction through BIM tools. Explaining 'Level of details' and their impact on formulating project schedules & budget. Demonstrating commonly used BIM application tools such as REVIT, Navisworks, Microsoft project & Primavera for Scheduling and estimation.

Module III: Design Coordination - 4 weeks

Integrating models of all disciplines, checking conformity between architecture, structure & building services, understanding the system of building design coordination & clash detection.Developing the suitable workflow of modelling for 4D &5D simulations, transferring or linking models in REVIT &Navisworks, Understanding both the tools for clash detections, sequencing & other functions of construction management.

Module IV: BIM to the field- 3 weeks

Module should explain Sheet formatting & plotting, drawing sets, scales & paper sizes, annotations & other details, presentation and animations, Developing the fabrication or shop drawings. Basic energy Simulations using commonly used BIM applications. Other relevant details if felt important by the instructor may be deliberated.

Any important note or instruction for course coordinator

A small scale project model may be developed a fresh or taken up from previous semester for preparing schedules , budgets, clash detections & other activities.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- 'Ching Francis, (1979), Architecture Form, Space and Order, Van Nostrand Reinhold Company, New York.
- Neufert Ernst, (1970), Architect's Data, Crosby Lockwood and Sons, London.

Online Resources

- https://www.archdaily.com
- http://www.architectmagazine.com

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BAR1009 ENVIRONMENT IMPACT ASSESMENT

Course Code: BAR 1009 Credit Units: 02 L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To know the process of assessment of impact of architectural projects onenvironmental.
- To learn about the legal requirements of the prevalent acts on environmental protection.
- To able to create buildings having less impact of the environment.

Course Contents:

Module I: Introduction

Understanding Necessity of the EIA and Introduction to the existing EIA framework.Brief history of EIA in India andrelated developments.

Module II: EIAand related Acts

Detailed understanding of the Environmental Protection Act 1986, its clauses, role and responsibilities of different bodies and formation of EIA rules/Act. Necessity of EIA and environmental clearance of projects. Awareness of Central and State Government Acts.

Module III: EIAProcedure

Definition of environmental impact assessment; Methods of EIA, procedures, formats, important clearances and legal framework.Financial impact of EIA.Understanding of the projects requiring the Environmental clearance and their procedure.

Module IV: Case Studies of EIA and Environmental Clearance

Case studies for applications to of concepts to projects of various scales-individual buildings, group buildings etc.Emphasis shall be on cost benefit analysis.

Project: Student must do environmental impact assessment exercise for any of their design studio project.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Canter, R.L., "Environmental Impact Assessment", McGraw Hill Inc., New Delhi, 1996.
- Shukla, S.K. and Srivastava, P.R., "Concepts in Environmental Impact Analysis", Common Wealth Publishers, New Delhi, 1992.
- Environmental Protection Act 1986 with UpToDate revisions.

References

- John G. Rau and David C Hooten "Environmental Impact Analysis Handbook", McGraw Hill Book Company, 1990.
- "Environmental Assessment Source book", Vol. I, II & III. The World Bank, Washington, D.C., 1991.
- Judith Petts, "Handbook of Environmental Impact Assessment Vol. I & II", Blackwell Science, 1999.
- Prof. Singh Jitendra, Environmental Impact Assessment Report

BAR 1010 PREFABRICATION

Course Code: BAR 101 Credit Units: 02 L/1-T/1-P/0 Teaching hours: 02

Course Objective:

- To understand the Prefabrication techniques in the residential & industrialized construction and also understanding of prefabricated elements.
- To familiarize the students with construction method/ techniques used for these elements in building works.

Course Contents:

Module I: Introduction of prefabrication – 3 Weeks

Need & importance of prefabrication technique, benefits and drawbacks of prefabrication, Principles, Materials, Modular construction technique, Standardization, Systems, Production, Transportation and Erection.

Module II: Prefabricated Components- 2 Weeks

Behavior of structural components, Large span constructions, Construction of roof and floor slabs, Wall panels, Columns & Shear walls.

Module III: Design Principle -2 Weeks

Disuniting of structures- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.

Module IV: Joints in Structural Members- 3 Weeks

Joints for different structural connections – Dimensions and detailing – Design of expansion joints. Basic Construction and fixing details used for various prefabricated panel/ elements, their applications, types, pricing, advantages & disadvantages

Module V: Design for Abnormal Loads- 3 Weeks

Progressive collapse – Code provisions – Equivalent design loads for considering abnormal effects such as earthquakes, cyclones, etc., – Importance of avoidance of progressive collapse.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- CBRI, (1990) Building materials and components, India,
- Gerostiza C.Z., Hendrikson C. and Rehat D.R. (1994), "Knowledge based process planning for construction and manufacturing", Academic Press Inc.
- Koncz T. (1976)., "Manual of precast concrete construction", Vol. I, II and III, Bauverlag, GMBH.
- Netherland BetorVerlag, (2009) "Structural design manual", Precast concrete connection details, Society for the studies in the use of precast concrete.

BAR1011 VIRTUAL ARCHITECTURE

Course Code: BAR 1011 Credit Units: 02 L/1-T/1-P/0 **Teaching hours: 02**

Course Objective:

- To familiarize students with recent trends that led to development of virtual architecture with development of virtual reality and simulation technology
- To train students in basic and advance softwares for architectural visualization

Course Contents:

Module I: Introduction- 2 weeks

Definition of virtual architecture, historic developments tracing influence of virtual reality and simulation technology on the contemporary architecture, advantages and disadvantages, major movements, key architects and architectural examples of this era.

Module II: Basic Modeling and Rendering- 2 weeks

3D Cad Modeling, Wire frame, mesh, solid and superficial Management of the 3d scene, Poly-mesh modeling and for dividing surfaces, 3D animation, Basic surface materials, Elaboration of the image, direct analysis and experimentation of the most solid and fruitful techniques of modeling and of management of 3D geometries in the AutoCAD

Module III: Advanced Module- 3 weeks

BIM- Parametric modeling, Management of the 3d scene, Exterior and interior lighting, studio setup, Advanced surface materials, Creation of 3d models starting from a photogrammetric relief, Photorealistic rendering, 3D vegetation – environment design, Grammar of the direction, Elaboration of the image, Video compositing, Storyboard, Video mounting, Video post-production, Color correction, Multiphases and animation, Visual effects, 3D spaces

Module IV: Advanced architectural visualization- 3 weeks

Tools for photorealism, During the advanced module of the Masters, students will explore techniques of BIM technology, modeling inside the Revit software.

Module V: Project - 4 weeks

Students will work on the research of the photorealism and of the quality of the image inside the3DS Max software, also thanks to the addition of a V-Ray output engine: this is a couple that since many years is the real standard in many productive realities all around the world.

Examination Scheme:

Components	A	CE	CT	EE
Weightage (%)	05	25	20	50

Text Books /Reference Books/Journals/Other Study Material:

- Conway Lloyd Morgan, GiulianoZampi, Virtual Architecture, 1995, McGraw-Hill Inc.,US Marta Jecu, Architecture and the Virtual, 2015, Intellect
- Don Cameron, Greg Regnier, The Virtual Interface Architecture, 2002, Intel Press
- Daniela Bertol, David Foell, Designing digital space: an architect's guide to virtual reality, 1997, Wiley
- Michael Beigl, Disappearing Architecture: From Real to Virtual to Quantum, 2005, Springer Science & Business Media