

DEPARTMENT OF ARCHITECTURE & PLANNING



Sir Mokshagundam Vishvesvaraya



COURSE BOOK

for
B. Arch



VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY

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VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY,
Nagpur-440 010 (M.S.)

Department of Architecture & Planning



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Dr. Meenal Surawar

Course book Coordinator

Dr. Vijay Kapse

Head of the Department



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Institute Vision Statement

To contribute effectively to the National and International endeavor of producing quality human resource of world class standard by developing a sustainable technical education system to meet the changing technological needs of the Country and the World incorporating relevant social concerns and to build an environment to create and propagate innovative technologies for the economic development of the Nation.

Institute Mission Statement

The mission of VNIT is to achieve high standards of excellence in generating and propagating knowledge in engineering and allied disciplines. VNIT is committed to providing an education that combines rigorous academics with joy of discovery. The Institute encourages its community to engage in a dialogue with society to be able to effectively contribute for the betterment of humankind.

Department Vision Statement

The vision is to nurture and groom future architects and urban planners by inculcating a sense of commitment, professionalism and consciousness to meet the emerging challenges in the fields of Architecture and Urban Planning professions and to fulfil the aspirations of the society.

Department Mission Statement

The mission is to facilitate the Architecture and Urban Planning education by the integration of one's creative and technical competencies. It aims at creating a sensitive and empathetic human resource, capable to address balanced social, cultural, economic and environmental concerns through built environment.

Brief about Department of Architecture & Planning

The Department of Architecture & Planning started in 1948 at Govt. Polytechnic Nagpur is amongst the first few pioneering courses in the country. Since its inception as a four years Diploma course in the Govt. Polytechnic, which subsequently became five years Diploma equivalent to G.D. Arch. (Govt. Diploma in Architecture) and finally developed as a five years Bachelor of Architecture (B.Arch.) Degree course affiliated to Nagpur University. The course was transferred to V.R.C.E. Nagpur in September 1965. The first B. Arch. degree batch passed out in the year 1966. This marks the genesis of architectural education at the Dept. of Architecture, V.R.C.E. (now V.N.I.T). Department of Architecture and Planning V.R.C.E. / V.N.I.T. Nagpur, has always played a significant role in initiation & propagation of architectural education in central region, in India and outside as well. The alumni's from Department are occupying key positions in different Sectors of Govt. / Semi – Govt. offices, departments and institutions. In the past over five decades, the department has provided the best Students, Architect- professionals & academicians who are contributing effectively all over in India and abroad.



List of Faculty Members

Sr. No.	Name of faculty	Area of specialization
1	Dr. Vijay S. Kapse	Construction Technology, Low Cost Housing, Architectural Graphics, Architectural Design, Urban Planning, Urban Poverty
2	Dr. Vinayak S. Adane	Building Services, Construction, Design, Planning Studio, Urban Infrastructure Planning
3	Dr. Rajashree Kotharkar	Urban Planning Urban Sustainability, Green Architecture, Urban Heat Island studies, Compact city concept, RS & GIS
4	Dr. Vilas K. Bakde	Building Construction, Building specification, Working Drawing and Detailing, Urban Housing for poor, Slum and city planning, Building Byelaws
5	Dr. Chandra Sabnani	Interior Design, Appropriate Technology, Architectural Design, Low Cost Housing, Urban Planning
6	Dr. Akshay Patil	Urban Design, Complexity Theory, Agent-Based-Modelling.
7	Dr. Smita Khan	Architectural Design, History & Theory of Architecture, Basic and Visual Arts, Interior & Space Design, Environment behavior studies, Building Performance Assessment, Post Occupancy Evaluation, Architectural Pedagogy, Contemporary vernacular studies
8	Prof. Kishor N. Joglekar	Construction, Architectural Graphics, Working Drawing, Transportation Planning
9	Dr. Sameer Deshkar	Environmental Planning, Climate Change Adaptation & Disaster Risk Reduction, Resilient Cities, Urban Biodiversity Conservation, Green Infrastructure Planning
10	Dr. Amit Wahurwagh	Architectural Conservation, Cultural Landscapes, Architectural Knowledge systems
11	Dr. Vidya V.Ghuge	Architectural Design, Urban Planning, Planning Legislation and Urban Management, Building Materials, RS & GIS Applications, Urban Form and Climate Studies
12	Dr. Amit Deshmukh	Architectural Design and working drawings, Urban Building Legislations, Computer Simulation, Disaster Management & Mitigation, Urban Development Plans
13	Dr. Sarika Bahadure	Urban Planning, Construction, Design, Sustainable Development, Building Materials
14	Dr. Pankaj Bahadure	Urban Planning, Compact City Ideas, Housing
15	Dr. Meenal Surawar	Theory of Architecture, Landscape Design, Architectural Design, Urban Planning, Urban Sustainability, Urban Heat Island studies, Housing, Urban Sprawl, Remote Sensing & GIS techniques



Programmes Offered

Course	Program	Description
UG	B. Arch.	Intake: Current = 62 +DASA From 2019-20 = 78 + DASA
PG	M. Tech. in Urban Planning	Intake: Current = 20+ 5 (Sponsored candidates) = 25 From 2019-20 = 25 + 5 (Sponsored candidates)
PhD	Architecture & Urban Planning	---

Credit System at VNIT

Education at the Institute is organized around the semester-based credit system of study. The prominent features of the credit system are a process of continuous evaluation of a student's performance / progress and flexibility to allow a student to progress at an optimum pace suited to his/her ability or convenience, subject to fulfilling minimum requirements for continuation. A student's performance/progress is measured by the number of credits he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum number of credits and a minimum grade point average must be acquired by a student in order to qualify for the degree.

Course credits assignment

Each course, except a few special courses, has certain number of credits assigned to it depending on lecture, tutorial and laboratory contact hours in a week.

For Lectures and Tutorials: One lecture hour per week per semester is assigned one credit and

For Practical/ Laboratory/ Studio: One hour per week per semester is assigned half credit.

Example: Course XXXXXX with (3-0-2) as (L-T-P) structure, i.e. 3 hr Lectures + 0 hr Tutorial + 2 hr Practical per week, will have $(3 \times 1 + 0 \times 1 + 2 \times 0.5 =) 4$ credits.

Grading System

The grading reflects a student's own proficiency in the course. While relative standing of the student is clearly indicated by his/her grades, the process of awarding grades is based on fitting performance of the class to some statistical distribution. The course coordinator and associated faculty members for a course formulate appropriate procedure to award grades. These grades are reflective of the student's performance vis-à-vis instructor's expectation. If a student is declared pass in a subject, then he/she gets the credits associated with that subject.



Depending on marks scored in a subject, a student is given a Grade. Each grade has got certain grade points as follows:

Grade	Grade points	Description
AA	10	Outstanding
AB	9	Excellent
BB	8	Very good
BC	7	Good
CC	6	Average
CD	5	Below average
DD	4	Marginal (Pass Grade)
FF	0	Poor (Fail) /Unsatisfactory / Absence from end-sem exam
NP	-	Audit pass
NF	-	Audit fail
SS	-	Satisfactory performance in zero credit core course
ZZ	-	Unsatisfactory performance in zero credit core course
W	-	Insufficient attendance

Performance Evaluation

The performance of a student is evaluated in terms of two indices, viz, the Semester Grade Point Average (SGPA) which is the Grade Point Average for a semester and Cumulative Grade Point Average (CGPA) which is the Grade Point Average for all the completed semesters at any point in time. CGPA is rounded up to second decimal.

The Earned Credits (ECR) are defined as the sum of course credits for courses in which students have been awarded grades between AA to DD. Grades obtained in the audit courses are not counted for computation of grade point average.

Earned Grade Points in a semester (EGP) = Σ (Course credits x Grade point) for courses in which AA-DD grade has been obtained

SGPA = EGP / Σ (Course credits) for courses registered in a semester in which AA- FF grades are awarded

CGPA= EGP / Σ (Course credits) for courses passed in all completed semesters in which AA- DD grades are awarded

**Overall Credits Requirement for Award of Degree**

SN	Category of Course	Symbol	Credit Requirement			
			B. Tech. (4-Year)	B. Arch. (5 Year)	M. Tech. (2 Year)	M. Sc. (2 Year)
Program Core						
1	Basic Sciences (BS)	BS	18	04	-	-
2	Engineering Arts & Sciences (ES)	ES	20	18	-	-
3	Humanities	HU/ HM*	05	06	-	-
4	Departmental core	DC	79-82	168	33-39	54-57
Program Elective						
3	Departmental Elective	DE	33-48	17-23	13-19	06-09
4	Humanities & Management	HM	0-6	0-3	-	-
5	Open Course	OC	0-6	0-3	-	-
Total requirement :BS + ES + DC+ DE + HM + OC =			170	219	54	63
Minimum Cumulative Grade Point Average required for the award of degree			4.00	4.00	6.00	4.00

Attendance Rules

1. All students must attend every class and 100% attendance is expected from the students. However, in consideration of the constraints/ unavoidable circumstances, the attendance can be relaxed by course coordinator only to the extent of not more than 25%. Every student must attend minimum of 75% of the classes actually held for that course.
2. A student with less than 75% attendance in a course during the semester, will be awarded W grade. Such a student will not be eligible to appear for the end semester and re-examination of that course. Even if such a student happens to appear for these examinations, then, answer books of such students will not be evaluated.
3. A student with W grade is not eligible to appear for end semester examination, reexamination & summer term.



Method of Assessment

1. Lecture Course (L): Remains same as per institute norms.

2. Studio Course (P):

Continuous evaluation same as P type course as per institute norms

A. Architectural Design Courses should have: Minor Problem, Major Problem and External Viva

B. Architectural Design assignments shall be of group (minor) & individual (major) type.

3. Assessment Method for combined Lecture and Studio Course:

The marks percentage distribution is as follows:

Ses I	Ses II	ESE (End Sem Exam)	Mid Term Evaluation I (MTA I)	Mid Term Evaluation II (MTA II)	End Term Evaluation (ETA)
10	10	30	15	15	20

- Studio assessment should be done one week prior to the End Semester Exam (ESE).
- Student failing to get 40% marks in the studio component of the subject will not be allowed to appear for the End Exam and he/she will be awarded FF grade
- The student will be asked fresh registration for the course in the subsequent Even/Odd semester.

Prerequisite:

- The students should have earned credits for all previous Architectural Designs including Basic Design to be eligible to register for Project in X semester.
- The Student should have earned 140 credits to be eligible to register for Practical Training.
- The students with backlog should be allowed to register for TWO courses along with Practical Training in IX Semester (two Theory Type or one Theory and one Studio type or one theory and one Combine theory studio type)

Zero Credits

Courses:

Health Information and Sports- Part1 and Part 2 are zero credit course (same as Institute norms).

Electives:

- There are 8 elective subjects to be offered.
- The student should select one in X Semester.
- The department should offer minimum two courses under each elective head.

Study-Tour:

- Study tour is integrated with Architectural Design I, II/III, IV/V, VI/ VII with weightage of 10-20%.



NOTES:

- All studios shall involve a field visit for about ten days duration to selected area/ city/ region for survey and documentation purpose.
- Evaluation of studios would be done on continuous basis with final external review
- ART 503 (Project appraisal/ Training) to be taken up during summer vacation and evaluation would be done through external viva-voce examination
- Completion of minimum 25 credits up to Second semester and pass in Planning Studio - I and Planning Studio - II is prerequisite for registration to Third semester courses.
- Completion of all credit requirements up to Third semester is prerequisite for registration to Project Phase- II (Thesis) in Fourth semester.

Program Outcomes (Department Specific) For B. Arch

The program enables the students with enhanced know how in Design process, Technology, and socio-cultural domains to address the emerging challenges in the field of Architecture.

1. The program enhances the student's skills in handling various tools and techniques relevant to architectural design and embrace the emerging changes at global level.
2. The program induces the thought process adapting to the varying needs of the society due to socio-technical transformations and sensitizing students to the allied discipline of architecture.
3. The program provides an opportunity to the students to explore upcoming domains in built environment through the introduction of relevant electives.

**MAPPING OF COURSE****B. ARCH, Semester I**

Sr. No.	CODE	COURSE NAME	Type	STRUCTURE			CREDITS
				L	T	P	
1	ARP 161	Basic Design	DC	0	1	6	4
2	ARP 162	Graphics I	DC	0	0	4	2
3	ARP 163	Visual Arts	DC	0	0	4	2
4	ARL 158	Construction I	DC	2	0	4	4
5	ARL 151	Building Materials	DC	3	0	0	3
6	ARL 152	History of Architecture I	DC	3	1	0	4
Total Core Credits				19			
7	HUL 179	Communication Skills	HU	2	0	2	3
8	MAL 103	Mathematics	BS	3	1	0	4
9	SAP 101	Health Information and Sports- Part1		0	0	2	0
6 DC + 0 DE + 1 HU + 1BS = 26 Credits							

B. ARCHITECTURE, Semester II

1	ARP 164	Architectural Design I	DC	0	1	6	4
2	ARP 165	Graphics II	DC	0	0	4	2
3	ARP 166	Modeling Workshop	DC	0	0	4	2
4	ARL 159	Construction II	DC	2	0	4	4
5	ARL 153	Climate Responsive Architecture	DC	3	1	0	4
6	ARL 154	History of Architecture II	DC	3	0	0	3
7	ARL 155	Theory of Architecture	DC	3	0	0	3
Total Core Credits				22			
8	AML 169	Engineering Mechanics	ES	3	1	0	4
9	SAP 102	Health Information and Sports- Part2		0	0	2	0
7 DC + 0 DE + 1 ES = 26 Credits							

L-T-P = 3-1-0 Means, Three Theory hrs. + One Tutorial hrs. + Zero Labs or Practical hrs. per Week. L-T-P = 0-0-4 Means, Four hrs. of Studio or Practical per Week

**B. ARCHITECTURE, Semester III**

1	ARP 271	Architectural Design II	DC	0	1	6	4
2	ARP 272	Graphics III	DC	0	0	4	2
3	ARL 258	Construction III	DC	3	0	4	5
4	ARL 251	History of Architecture III	DC	3	1	0	4
Total Core Credits				15			
Electives							
5 / 6	ARL 261	Advanced Building Materials	DE (1 & 2)	3+3	0	0	3+3
	ARL 262	Art & Architecture Appreciation					
	ARL 263	Environmental Studies					
	ARL 264	Green Architecture					
	ARL 265	Barrier Free Environmental Design**					
Total Elective Credits				6			
7	CEP 283	Surveying	ES	0	0	4	2
8	AML 281	Strength of Materials	ES	3	1	0	4
4 DC + 2 DE + 2 ES = 27 Credits							

B. ARCHITECTURE, Semester IV

1	ARP 273	Architectural Design III	DC	0	1	6	4
2	ARP 274	Computer Aided Design and Simulation	DC	0	0	4	2
3	ARL 259	Construction IV	DC	3	0	4	5
4	ARL 252	Building Services I	DC	3	1	0	4
5	ARL 253	History of Human Settlements	DC	3	0	0	3
6	ARL 254	Environment Behavioral Studies	DC	3	0	0	3
Total Core Credits				21			
7	ARP 276	Visual Communication	DE (3)	0	0	4	2
	ARP 277	Building Documentations					
8	ARL 266	Vernacular Architecture	DE (4)	3	0	5	3
	ARL 267	Contemporary Design Theory and Criticism					
	AML 381	Theory of Structure					
	ARL 268	Contemporary Bamboo Architecture-I					
Total Elective Credits				5			
6 DC + 2 DE = 26 Credits							

L-T-P = 3-1-0 Means, Three Theory hrs. + One Tutorial hrs. + Zero Labs or Practical hrs. per Week. L-T-P = 0-0-4 Means, Four hrs. of Studio or Practical per Week

**B. ARCHITECTURE, Semester V**

1	ARP 361	Architectural Design IV	DC	0	1	8	5
2	ARP 362	Working Drawing I	DC	0	0	4	2
3	ARL 358	Construction V	DC	3	0	4	5
4	ARL 351	Building Services II	DC	3	1	0	4
5	ARL 352	Specifications	DC	3	0	0	3
6	ARL 353	Building Legislation	DC	3	0	0	3
Total Core Credits				22			
7	AML 482	Concrete Structures	ES	3	1	0	4
6 DC + 1 ES = 26 Credits							

B. ARCHITECTURE, Semester VI

1	ARP 363	Architectural Design V	DC	0	1	8	5
2	ARP 364	Working Drawing-II	DC	0	0	4	2
3	ARL 359	Construction VI	DC	3	0	4	5
4	ARL 354	Building Services III	DC	3	0	0	3
5	ARL 355	Acoustics	DC	3	0	0	3
6	ARL 356	Estimation and Valuation	DC	3	0	0	3
Total Core Credits				21			
7	AML 481	Steel Structures	ES	3	1	0	4
6 DC + 1 ES = 25 Credits							

L-T-P = 3-1-0 Means, Three Theory hrs. + One Tutorial hrs. + Zero Labs or Practical hrs. per Week. L-T-P = 0-0-4 Means, Four hrs. of Studio or Practical per Week

B. ARCHITECTURE, Semester VII

1	ARP 481	Architectural Design VI	DC	0	1	8	5
2	ARL 458	Landscape Design	DC	2	0	4	4
3	ARL 454	Urban Planning and Design	DC	3	0	0	3
4	ARL 455	Professional Practice	DC	3	0	0	3
Total Core Credits				15			
5/6	ARL 461	Disaster Mitigation and Management	DE (5 & 6)	3+3	0	0	3+3
	ARL 462	Appropriate Technology					
	ARL 463	Rural Planning and Development					
	ARL 464	Building Repair and Restoration					
	AML 483	Earthquake Resistant Structures					
	ARL 405	Universal Design**					
Total Elective Credits				6			
6 DC + 2 DE = 21 Credits							

**B. ARCHITECTURE, Semester VIII**

1	ARP 482	Architectural Design VII	DC	0	1	8	5
2	ARL 459	Interior Design	DC	2	0	4	4
3	ARL 453	Construction and Project Management	DC	3	0	0	3
Total Core Credits				12			
4	ARL 466	Project Proposals and Documentations	DE (7)	3	0	0	3
	ARL 467	Architectural Conservation					
	ARL 468	Architectural Research Methods					
	*ARL 456	Contemporary Bamboo Architecture-II					
Total Elective Credits				3			
5	HUL	Building Economics & Real Estate Development	HU	3	0	0	3
3 DC + 1 DE + 1 HU = 18 Credits							

L-T-P = 3-1-0 Means, Three Theory hrs. + One Tutorial hrs. + Zero Labs or Practical hrs. per Week. L-T-P = 0-0-4 Means, Four hrs. of Studio or Practical per Week

B. ARCHITECTURE, Semester IX

1	ARC 401	Practical Training	DC	0	0	8	8
1 DC = 8 Credits							

B. ARCHITECTURE, Semester X

1	ARD 401	Project I (Seminar and Dissertation)	DC	0	0	6	3
2	ARD 402	Project II	DC	0	0	20	10
Total Core Credits				13			
3	ARL 469	Housing	DE (8)	3	0	0	3
	ARL 470	Infrastructure Planning and Design					
	ARL 471	Industrial Architecture					
Total Elective Credits				3			
2 DC + 1 DE = 16 Credits							

Total UG Credits = 219



COURSE SYLLABUS OF B. ARCHITECTURE

B. ARCH. SEMESTER I

SUBJECT NAME: BASIC DESIGN	SUBJECT CODE: ARP 161 (DC) L-T-P (Credits): 1-0-6 (4)	B. ARCH. SEMESTER: I
Objective:		
<ul style="list-style-type: none"> To introduce the various facets of art and architecture and formal vocabulary of design. To understand the elements and principles of Basic Design as the building blocks of creative design and visual composition. To nurture creativity and sensitise the pupil to various design aspects. 		
Course:		
<p>Introduction to Architectural Design through Basic Design Terminology and concepts.</p> <ul style="list-style-type: none"> Elements of Design: Properties, qualities and characteristics of point, line, direction, plane, shape, form, colour and texture Principles of Design: Scale, Proportion, Balance, Harmony, Rhythm Contrast, etc. <ul style="list-style-type: none"> Elementary design exercises for study and exploration using elements and principles of design by means of two and three dimensional compositions. Introduction to Expression in Art and Architecture - sense of enclosure-openness, robustness, dynamism, spatial geometry, etc Appraisal of design form in terms of visual character, play of light and shade, solids and voids etc. <p>Sessional work: Number of exercises in the form of design studios, seminars and creative workshops.</p>		
Method of Assessment:		
Assessment of students' work, Progressive evaluation at three stages, Time Problem.		
Expected Outcome:		
<ul style="list-style-type: none"> Understanding of the qualities and effects of different elements and principles of design along with their composite fusion. Understanding of space and form through 2D and 3D Composition. 		
References:		
<ol style="list-style-type: none"> Charles Wallschlagger and Cynthia Busic-Snyder, “Basic Visual Concepts and Principles for Artists, Architects and Designers”, Mc Graw Hill, New York 1992. Exner V., Pressel D., “Basics Spatial Design”, Birkhanser, 2009. Francis D.K.Ching, “Architecture: Form, Space and Order”, Van Nostrand Reinhold Co., (Canaa), 1979. Joshua C. Taylor, “Learning to Look: A Handbook for the Visual Arts”, (Phoenix Books), University Of Chicago Press, 1981 Mark Baskinger and William Bardel, “Drawing Ideas: A Hand-Drawn Approach for Better Design”, Watson-Guptill, 2013. Nathan Knobler, “Visual Dialogue”, Harcourt School; 3 Sub Edition, 1980. 		



7. Owen Cappleman and Michael Jack Jordon, “**Foundations in Architecture: An Anotated Anthology of Beginning Design Project**”, Van Nostrand Reinhold New York, 1993.
8. Paul J. Zelanski and Mary Pat Fisher, “**The Art of Seeing**”, Pearson, 2010.
9. Pramara V.S., “**Design fundamentals in Architecture**”, Somaiya Publications Pvt. Ltd., New Delhi, 1973.

Pre-requisite:

Nil

SUBJECT NAME: GRAPHICS I	SUBJECT CODE: ARP 162 (DC) L-T-P (Credits): 0-0-4 (2)	B. ARCH. SEMESTER: I
Objective:		
<ul style="list-style-type: none"> • The Subject is aimed at developing the drawing skills as tools for creative thinking, visualization, perception, imagination, representation and to understand fundamentals of architectural drawing. • Students shall understand the graphic treatment of two and three dimensional drawings including perception and presentation of simple architectural shapes, forms and basic elements of building /structure. • Students shall also be familiarized for preparing and developing architectural innovative presentation techniques including lettering and rendering, etc. 		
Course:		
<ul style="list-style-type: none"> • Introduction to architectural drafting Architectural techniques. Drawing of different types of Architectural Letterings. • Understanding concept of Scale, their construction including Plain and Diagonal scales. Knowing use of architectural scale in drawings. Drawing of interesting 2 dimensional images in Reduced and Enlarge scales. • Concept of Orthographic Projections. Introduction to projections of basic elements like ...point, lines, planes and solids with reference to HP and VP. Drawing of relevant simple compositions in plan and all elevations. • Sections and true sections of all types of solids in different positions. • Development of lateral surface of all types of solids. • Explaining concept of Isometric & Axonometric projections / views. Understanding concept of Isometric scale. Drawing of Isometric views of all simple solids including few of interesting compositions of building elements like column, beam and slabs etc. • Graphical codes / symbolical presentations (in plans, sections and elevations) of basic building materials and constructional elements, furniture, services like water supply, sanitation and electrical etc. • Preparation of presentation drawings (plan and elevations) of minor innovative built form, furniture, building components etc. 		
Method of Assessment:		
Plates, sketches and tests.		
Expected Outcome:		

**References:**

1. Bhatt N. D. “Engineering Drawing”, Charotar Publishing House.
2. John Montague, Willey, John Willey and sons, Inc. “Basic Perspective Drawing”, A Visual Approach, Sixth Edition.
3. Shah, Kale & Patki, “Building Drawing”, Tata McGraw-Hill Book Co.
4. Mulik S.H. “Perspective & Sciography”,
5. Narayanan K.L. “Engineering Drawing”, SciTech Publications.

Pre-requisite:

Nil

SUBJECT NAME: VISUAL ARTS	SUBJECT CODE: ARP 163 (DC) L-T-P (Credits): 0-0-4 (2)	B. ARCH. SEMESTER: I
Objective:		
<ul style="list-style-type: none"> • This studio aims at imparting basic artistic backing essential in architectural learning. The objectives of the course include polishing the skills of the hand by intensive working with different mediums to help enhance self-expression through effective visual presentation. It also includes study of basic principles of visual arts and relationship of allied forms of art, their contributions in the enrichment of architectural expression and understanding of Architectural Tectonics. 		
Course:		
<ul style="list-style-type: none"> • Mediums of Expression. Use of pencil, pen and ink and charcoal sketching, Learning through exercises of sketching, shading, free hand drawing, rendering etc. by use of mixed media rendering, water colour compositions and primary use of acrylic/ oil colours. Architectural sketching and rendering of historic and contemporary buildings using different mediums. • Colour theory. Hues, Chromatic and Tonal Values of colours. Colour wheel and colour composition, Properties (visual and psychological) of colour, Symbolism of colours, Types of colour schemes. • Alternative media exploration. Experimentation through advanced art exercises; glass painting, earthen pot painting, mural making, mixed media, collage etc. Link with digital media. • Principles of visual arts. Enhancing understanding by experimentation through use of elements of visual arts such as point, line, plane, form, space, colour, texture, light, solids and voids, shadow and shade etc. • Allied visual and performing arts and relationship to built environments. • Tectonics: Understanding of effect of scale, proportions, order, material effects such as textures, patterns, light, sound, temperature etc. in architectural spaces. 		
Method of Assessment:		
Continuous evaluation of studio work through midterm evaluations and end term evaluation on completed portfolio at semester end.		

**Expected Outcome:**

- Exercises of sketching, shading, free hand drawing, rendering etc. on sketch book, drawing sheets in studio and outdoor sketching etc.
- Experimentation with colours, learning through exercises and creative tasks.
- Seminar presentations, Book reviews, Notes and reports for study components.
- Model making and creative assignments to experiment and explore different media and possibilities for application in visual arts.

References:

1. Gill Robert; **“Rendering with Pen & Ink”**. Thames & Hudson, London.
2. Ruskin John; **“Seven lamps of Architecture”**, George Allen & Unwin Ltd., London, 1925.
3. Salingaros Nikos; **“A Theory of Architecture”**, Umbau, 2008.
4. **“Scott. Design Fundamentals”**.
5. Sukhatme Shirish; www.artinarch.co

Pre-requisite:

Nil

SUBJECT NAME: CONSTRUCTION I	SUBJECT CODE: ARL- 158 (DC) L-T-P (Credits): 2-0-4 (4)	B. ARCH. SEMESTER: I
Objective:		
<ul style="list-style-type: none"> • Objective of the course is to learn in progression various construction systems from simple building construction techniques to comprehensive, complex construction methods. The subject is focus on understanding the relationship between architectural design, building materials, services etc. Emphasis shall be on reasoning and analysis while acquainting the students with different building elements. The course shall aim at building a strong sense of visualization to enable students to evolve and apply alternative materials and methods of construction. At first year level student shall aware about various technical terms, basic principles of construction and methods / techniques of construction through various elements / components of building. 		
Course:		
<ul style="list-style-type: none"> • Introduction to various elements of building from foundation to roof. • General idea of load transmission in load bearing & frame structures, their advantages, disadvantages and suitability. • Introduction to various types of foundations with emphasis on simple foundation for load bearing walls, plinth filling, steps, etc. • Various types of construction in brick and stone masonry. Types of bond – English, Flemish, Local etc. • Introduction to various types of Lintels and Arches. • Introduction to basic tools and equipments used in construction. 		



Method of Assessment:
Sessional and End term Examination. Continuous evaluation of student work and Teacher Assessment.
Expected Outcome:
References:
<ol style="list-style-type: none"> 1. Arora, S.P. & Bindra, S.P., “A Text Book of Building Construction”, Dhanpat Rai & Sons, New Delhi, 1994. 2. Barry R., “Construction of Building”, Orient Longman lid, 1999. 3. Chudley R., “Building Construction Handbook”, British library cataloguing, 2008. 4. Francis DK Ching, “Building Construction Illustrated”, Van Nostrand Reinhold Ltd., 2001. 5. Goyal, M.M , “Handbook of Building Construction”, Thomson Press.2004 6. Jha, J. & Sinha, S.K., “Building Construction”, Khanna Publishers, New Delhi, 1977. 7. Kumar S.K., “Building Construction”, Standard publisher. 2003. 8. Mckay, W.B, “Building Construction” - Vol. I, Longman, 2005. 9. Mehta, M., Scarborough, W. and Armpriest, Diane, “Building Construction: Principles, Materials and Systems”, Pearson Prentic Hall, 2008. 10. Punmia B.C., “Building Construction”, Laxmi Publications Pvt. Ltd., 1995. 11. Rangwala S.C., “Building Construction”, Charotar Publishing House, 1963. 12. Simmons H. L, “Olin’s Construction Principles, Materials and Methods”, John Wiley and Sons, 2007.
Pre-requisite:
Nil

SUBJECT NAME: BUILDING MATERIALS	SUBJECT CODE: ARL-151 (DC) L-T-P (Credits): 3-0-0 (3)	B. ARCH. SEMESTER: I
Objective:		
The objective of the course is to make the students aware of various building materials used in construction industries and to understand their relationship with architectural design and building construction.		
Course:		
Study of various materials used commonly for building construction in rural & urban areas, with their properties, various types, market forms available and application in buildings.		
<ul style="list-style-type: none"> • Clay products: Classification of bricks, Fire Brick, Fly Ash Bricks, Tiles, Terra-cotta, Earthenware, Porcelain, Stoneware. • Stones: Uses of Stones, Qualities of Good Building Stones, Dressing, Common Building Stones of India, Artificial Stone. 		



<ul style="list-style-type: none">• Cement: Properties, Different Types and Uses in Building construction• Mortar & Concrete: Composition, Classification and Uses of Mortar, Proportioning Concrete, Curing, and Types Of Concrete.• Glass: Classification with Commercial Forms, their Suitability, limitations, precautions, etc.• Timber: Market Forms & Industrial Timber, their suitability, limitations, precautions, etc.• Metals: Ferrous & Nonferrous Metals and Alloys, Commercial Forms, their Suitability, limitations, precautions, etc.• Paints and Varnishes: Different types of paints, method of application on different surface, their Suitability, limitations, precautions, etc.
Method of Assessment:
Tests, Assignments, Site Visit and Market Survey Reports
Expected Outcome:
To make the students aware about the different materials available for building materials along with their properties, uses, their Suitability, limitations, precautions, etc.
References:
<ol style="list-style-type: none">1. P.G. Varghese, “A Text Book of Building Materials”, Prentice-Hall of India Pvt. Ltd., Publication.2. Mohan Rai and M.P. Jain “Advances in Building Materials and Construction” Singh publication by CBRI, Roorkee.3. H. Zhang , “Building Materials in Civil Engineering” ,Woodhead Publishing, ISBN: 978-1-84569-955-04. Arora, “Building Materials”,5. Khanna, “Civil Engineers Hand Book”6. Chaudhary, “Engineering Materials Engineering Materials”, Dr. Janardan Jha Khanna Publishers.7. R K Rajpoot, “Engineering Materials”,8. Rangawala P.C. “Engineering Materials”, Charter Publishing House, Anand, India.9. Sushil Kumar, “Engineering Materials”, Standard Publication and Distributors, New Delhi.10. Chakraborti M “Estimating, Costing, Specification and Valuation in Civil Engineering” (English) 24th Edition11. “National Building Code 2005”.12. “Use of Bamboo & reeds in construction”, UNO publications.
Pre-requisite:
Nil



SUBJECT NAME: HISTORY OF ARCHITECTURE I	SUBJECT CODE: ARL-152 (DC) L-T-P (Credits): 3-1-0 (4)	B. ARCH. SEMESTER: I
Objective:		
Study the chronological evolution and impacts of geographic, climatic, geological, religious, political and socio-cultural backgrounds of Indian ancient and medieval architecture – in relationship to materials and techniques of construction.		
Course:		
Introduction to evolution of built form design as a result of socio cultural, physical, technological factors manifested in design attitudes during various phases in history. <ul style="list-style-type: none">• Understanding of the causative forces - the cultures, history, socio religious practices and institution, political and economic conditions, issues of land, climate and technology, Historical and Primitive Architecture.• Study of architectural developments in India from Indus valley culture to rise, spread & decline of Buddhism & Jainism. Rock-cut Architecture.• Evolution of Hindu Temple: Gupta, Aihole, Badami, Pattadakal, Mahabalipuram. Indo Aryan Style: Orrisa, Khajuraho, Gujarat, Rajasthan. Dravidian Style: Chola, Chalukyan, Pandya, Pallava, Hoysala Style, Revival of Hindu architecture of South India at Vijaynagara and Madurai.• Indo Islamic Architecture in India: Imperial Architecture of Delhi, including Slave dynasty, Khilji dynasty, Tughlak dynasty, Sayyid dynasty, Lodhi dynasty.• Provincial Style Architecture: Development of regional styles noticed in various provinces such as Bengal, Jaunpur, Gujarat, Mandu, Deccan, Malwa and Bijapur.• Mughal Architecture of India– characteristics, styles, features of different periods and its blend on other styles and vice-versa. Maugham gardens.		
Sessional work: Sessional examination and End term Examination, Assignments, Site Visit, Reports, Seminars and Documentation of historic structure, Sketches, Plates, and tests.		
Method of Assessment:		
Tutorials work: aims at to generate interest in the theory course, enjoy and appreciate historic structures, changing the way architectural history is viewed and studied. Short exercise (in groups) on comparative studies and architecture timeline chart preparation; emphasize the connections, contrasts, and influences of architectural movements throughout history, Case studies and photo essays.		
Expected Outcome:		
References:		
<ol style="list-style-type: none">1. Bannister Fletcher, “A History of Architecture”, 20th edition, CBS Publishers and Distributors, New Delhi, 19992. Christopher Tadgell, “History of Architecture”3. Francis D.K.Ching, “A Global History of Architecture”, John Wiley and Sons., (Canada), 20114. Henri Stierlin, “Hindu India”, From Khajuraho to the temple city of Madurai, Taschen, Paris, ISBN 3-8228-7649-6		



5. Percy Brown, “**Indian Architecture (Buddhist and Hindu)**”, D. B. Taraporevala Sons and Co. Private Ltd., Bombay, India, 1995
6. Percy Brown, “**Indian Architecture (Islamic Period)**”, D. B. Taraporevala Sons and Co. Private Ltd., Bombay, India, 1995
7. Satish Grover, “**History of Architecture**”
8. Satish Chandra, “**History of Architecture & Ancient Building Materials in India**”
9. Simon Unwin, “**Analysing Architecture**”, Roulledge, London, 2003.

Pre-requisite:

Nil

SUBJECT NAME: COMMUNICATION SKILLS	SUBJECT CODE: HUL179 (HU) L-T-P (Credits): 2-0-2 (3)	B. ARCH. SEMESTER: I
Objective:		
To impart to the students the skills that they need in their academic, and later in their professional pursuit. To train the students to adopt an innovative approach to English language teaching and learning.		
Course:		
ENERGY: Oil, Nuclear Preparation, Alternative Sources COMPUTERS: Introducing Computers, New Frontiers, Computers in India TECHNOLOGY: Appropriate Technology, Printing, Evaluating Technology ENVIRONMENT: Pollution, Ecology, Our living Environment INDUSTRY: Personnel and Production, Safety and Training, Selling Product		
Method of Assessment:		
Expected Outcome:		
References:		
<ol style="list-style-type: none"> 1. Orient Longman , A Textbook of English for Engineers and Technologists. 2. Quirk R.and Greenbaum S., A University Grammar of English. 3. Krishnaswamy N., English Grammar (Longman Publication) (Macmillan India Ltd) 		
Pre-requisite:		
Nil		



SUBJECT NAME: MATHEMATICS	SUBJECT CODE: MAL103 (BS) L-T-P (Credits): 3-1-0 (4)	B. ARCH. SEMESTER: I
Objective:		
<ul style="list-style-type: none"> The objective of this subject is to expose student to understand the basic concepts of differential and integral calculus, ordinary differential equations, matrix theory, three dimensional geometry and basic statistics 		
Course:		
<p>Calculus: Tangent and Normal, Maxima and minima of functions of one variable, Curvature (Cartesian and Parametric form), Curve tracing, Taylor's and Maclaurin's expansion for one variable, Indeterminate forms, partial differentiation, Maxima and minima of functions of two variables.</p> <p>Double integrals, Calculation of areas using double integrals (Cartesian and Polar), Applications of double integrals for Centre of gravity and Moment of inertia.</p> <p>Ordinary Differential Equations: First order ODEs: Method of solution, orthogonal trajectories, Newton's law of cooling. Second and higher order linear ODEs: Solution of homogeneous and non-homogeneous linear equations with constant coefficients, Applications.</p> <p>Matrices: Review of inverse of a square matrix using Adjoint matrix. Rank of a matrix, consistency and inconsistency of system of linear equations, solution of LPP using graphical method.</p> <p>Three Dimensional Geometry: Directional Cosines and ratio's, angle between two lines, equations of straight line, coplanar lines, equation of plane, shortest distance between lines and planes, tangent plane and normal line, sphere.</p> <p>Statistics: Arithmetic mean, median, mode, standard deviation and variance, regression and correlation; Curve fitting, method of least squares (Straight line and parabola),</p>		
Method of Assessment:		
Expected Outcome:		
References:		
<ul style="list-style-type: none"> ➤ Kreyszig, E., "Advanced Engineering Mathematics", 8th Edition, John Wiley & Son New York 2008. ➤ Thomas G.B., "Calculus and Analytical Geometry", Addison Wesley, London, 1998. 		



- Grewal B.S., “**Higher Engineering Mathematics**”, Khanna Publishers, New Delhi, 2011.
- Jain, R.K. and Iyengar, S.R.K.; “**Advanced Engineering Mathematics**; Narosa Publishers 2005.
- Piskunov, N.: “**Differential and Integral calculus**”, Vol. 1, Vol. 2, MIR Publishers, Moscow - CBS Publishers and Distributors (India),1996.
- James Stewart, “**Calculus -Early Transcendental**”, Thomson Brooks/Cole, 2008.

Pre-requisite:

Nil

SUBJECT NAME:
HEALTH
INFORMATION AND
SPORTS-PART 1

SUBJECT CODE: SAP 101
L-T-P (Credits): 0-0-2 (0)

B. ARCH.
SEMESTER: I

Objective:

To provide physical fitness and good health. Create awareness among the students about their health status by conducting various tests and measurements and suggest them suitable remedial physical fitness program so that they can improve physical and physiological health status. To improve productivity, foster social harmony, inculcate sense of discipline and dedication in general life, develop the spirit of team work, through various sports activities.

Course:**Development of components of fitness through conditioning exercises:**

Strength: (Strength Endurance, Maximum Strength, explosive strength), **Endurance:** (aerobic endurance, anaerobic endurance, speed endurance and strength endurance), **Speed,** **Co-coordinative ability, Flexibility**

Physical Efficiency Test Level 1(Testing and Evaluation of Physical Fitness):

Cooper Test 12 minute run or walk test, Sit and reach test, 100 meter run, one minute sit up test, Push up/Bent knee push up test,

Teaching and development of sports skills: Cognitive, Perceptual, Motor, Perceptual motor.

First Aid training:

Intramural phase 1: Identification of sports talent through exposing students to inter-section tournament. Football, Volleyball, throw ball, table tennis & Chess.

Method of Assessment:**Expected Outcome:****References:****Pre-requisite:**

Nil

**B. ARCH. SEMESTER II**

SUBJECT NAME: ARCHITECTURAL DESIGN I	SUBJECT CODE: ARP 164 (DC) L-T-P (Credits): 1-0-6 (4)	B. ARCH. SEMESTER: II
Objective:		
<ul style="list-style-type: none"> • Conceptualization of Form, Space and Structure through creative thinking • Initiate Architectural Design Process. 		
Course:		
<ul style="list-style-type: none"> • Anthropometries, ergonomics, understanding basic human activities in Indian and Global context. • Measurement of known spaces and finding the horizontal and vertical relationship. • Application of Basic design in mono-cellular activity through the manipulation of elements and principle of design. • Spatial aspects related to form, function and expression. • Design of Single activity spaces and Multi activity spaces. 		
Sessional work: One design assignment, along with other design tasks and assignments.		
Suggested Designs:		
<ul style="list-style-type: none"> • Placement of built in and movable furniture in different architectural spaces w.r.t. openings locations. • Redesign of familiar spaces. • Residential Activity Space, Shop, Exhibition Pavilion, Children's Environment, Snack Bar, Petrol Bunk, Fire Station, Small Residence, Nursery School, Dispensary, etc. 		
Method of Assessment:		
Assessment of students 'work, Progressive evaluation at three stages, External Review.		
Expected Outcome:		
References:		
<ul style="list-style-type: none"> ➤ Ernst Neuferts, "Architects Data", Blackwell 2002. ➤ Francis D.K.Ching, "Architecture: Form, Space and Order", Van Nostrand Reinhold Co., (Canaa), 1979. ➤ Geoffrey H. Baker, "Design Strategies in Architecture- An Approach to the Analysis of Form", Taylor & Francis, 1996. ➤ Joseph De Chiara, Michael J Crosbie, "Time Saver Standards for Building Types", McGraw Hill Professional 2001. ➤ Joseph De Chiara, Julius Panero, Martin Zelnik, "Time Saver Standards for Interior Design and Space Planning", McGraw Hill 2001. ➤ N. John Habraken, Andrés Mignucci and Jonathan Teicher, "Conversations With Form: A Workbook for Students of Architecture", Routledge 2014. 		



- Owen Cappelman and Michael Jack Jordon, “**Foundations in Architecture : An Amotated Anthology of Beginning Design Project**”, Van Nostrand Reinhold New York, 1993.
- Pramur V.S., “**Design fundamentals in Architecture**”, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
- Ramsey et al, “**Architectural Graphic Standards**”, Wiley 2000.

Pre-requisite:

Nil

SUBJECT NAME: GRAPHICS II	SUBJECT CODE: ARP 165 (DC) L-T-P (Credits): 0-0-4 (2)	B. ARCH. SEMESTER: II
Objective:		
<ul style="list-style-type: none"> • To familiarize the students with preparation of perspective drawing and Sciography by innovative methods. • To teach the students with perspectives of interiors, Exteriors etc. and showing of shades & shadow. • To develop innovative presentation techniques in Perspective and Sciography. • Methodology: Lecture, Studios and Home Assignments 		
Course:		
Perspective Drawing:		
<ul style="list-style-type: none"> • Difference with metric projections. Anatomy of perspective: Station point, Eye level, Cone of vision, Picture plane, Horizon line, Ground line, Vanishing points etc. • Types of perspectives: One point, two points, Three point Perspectives of simple and complex blocks Perspectives of simple household furniture items Perspectives of Built Form. • Perspective Drawing by Innovative Methods: Preparation of Perspective by innovative methods like approximate method, Diagonal Method, Grid Method etc. And other innovative methods of perspective presentation including rendering in various medium. • One point and two points perspectives of interiors. Introduction to shortcut methods in perspective drawing. • Freehand perspective drawing. 		
Sciography :		
<ul style="list-style-type: none"> • Understanding Concept of Sciography and its importance in Architectural drawings. • Concept of Conventional Angle of Ray. Showing Sciography of Basic objects like point, line, planes and solids on one and both the planes. • Sciography of interesting architectural three dimensional compositions. • Showing Shades and shadows in the presentation drawings of small built forms including assignments taken based on same level Architecture Design. 		



Method of Assessment:
Plates, sketches and tests.
Expected Outcome:
References:
<ol style="list-style-type: none"> 1. Bhatta N. D., “Engineering Drawing”, Charotar Publishing House. 2. John Montague, Willey, “Basic Perspective Drawing, A Visual Approach”, Sixth Edition, John Willey and sons, Inc. 3. Narayanan, “Engineering Drawing”, SciTech Publications 4. Mulik S.H., “Perspective & Sciography”, 5. Shah, Kale & Patki, “Building Drawing”, Tata McGraw-Hill Education.
Pre-requisite:
Nil

SUBJECT NAME: MODELING WORKSHOP	SUBJECT CODE: ARP 166 (DC) L-T-P (Credits): 0-0-4 (2)	B. ARCH. SEMESTER: II
Objective:		
To acquire the skill in constructing three dimensional forms using different model making materials and equipment in different scale.		
Course:		
<ul style="list-style-type: none"> • Introduction to different materials like paper, thermocol, mud, wood, foam sheet, sun board, cork sheet, metal sheets, wires, plaster of Paris (PoP), etc. for making models. • Making basic shapes out of different materials to explore the nature and texture of the material. • Application of various tools and joining techniques required for model making. • Introduction to various types of models at appropriate scales- site model, study model, block model, finished presentation models, etc. • Elementary joinery in wood and plywood. • Models in appropriate scale for interior and exterior spaces. • Introduction to digital medium to explore models digitally. 		
Sessional work:		
Practical and job work to cover the topics mentioned above (related to Studio assignment).		
Method of Assessment:		
Assessment of students 'work, Progressive evaluation at three stages		



Expected Outcome:
Understand of different types of materials and its feasibility in model making.
References:
<ul style="list-style-type: none"> ➤ Akiko Busch, “The Art of the Architectural Model”, Design Pr,1991 ➤ John R. Taylor, “Model Building for Architects and Engineers”, McGraw-Hill Inc.,US,1971. ➤ Martha Sutherland, “Model Making: A Basic Guide (Norton Professional Books for Architects & Designers)”, W. W. Norton & Company 1999. ➤ Petra Schmidt and Nicola Stattmann, “Unfolded: Paper in Design, Art, Architecture and Industry”, Birkhauser Verlag AG, 2009. ➤ Rolf Janke, “Architectural Models”, 1978.
Pre-requisite:
Nil

SUBJECT NAME: CONSTRUCTION II	SUBJECT CODE: ARL 159 (DC) L-T-P (Credits): 2-0-4 (4)	B. ARCH. SEMESTER: II
Objective:		
<p>Objective of the course is to learn in progression various construction systems from simple building construction techniques to comprehensive, complex construction methods. The subject is focus on understanding the relationship between architectural design, building materials, services etc. Emphasis shall be on reasoning and analysis while acquainting the students with different building elements. The course shall aim at building a strong sense of visualization to enable students to evolve and apply alternative materials and methods of construction.</p> <p>At first year level student shall aware about various technical terms, basic principles of construction and methods / techniques of construction through various elements / components of building. Second semester syllabus is based on timber technology. Students shall aware about the carpentry joints and tools and equipment used in timber construction.</p>		
Course:		
<ul style="list-style-type: none"> • Timber Doors: Design considerations, Location of doors, Panelled, partly panelled and partly glazed shutters, flush shutters, and ledged, braced, battened and framed shutters. Joinery details of timber frame, styles, rails, panels etc., Fixtures and fastenings. • Timber Windows: Design considerations, Location of windows, fully glazed window, louvered, centrally pivoted, top hung windows, side hung, partly glazed, Joinery details of timber frame, style, rails, panels, fixing of glass, double glazing etc. Fixtures and fastenings. • Timber Roof: Classification of roof, various forms of roofs for different spans. Introduction to timber trusses and joinery details of tie beam, principal rafter, common rafter etc., Fixing of roof tiles. • Timber Floor: Functional requirements of floor in design and construction, Classification of floor - ground and upper floor. Introduction to timber floors in relation 		



<p>to spans, load transmission. Joinery details of bridging joist, binder, and girder etc., Types of strutting.</p> <ul style="list-style-type: none">• Timber staircase: Principles & components of staircase, Requirement of good staircase, Classification of staircase based on geometry and materials like timber, brick, stone, RCC etc. Joinery details of timber tread riser, baluster, handrail, newel post etc.• Introduction to basic tools and equipments used in timber construction.
Method of Assessment:
Sessional and End term Examination. Continuous evaluation of student work and Teacher assessment.
Expected Outcome:
References:
<ol style="list-style-type: none">1. Arora, S.P. & Bindra, S.P., “A Text Book of Building Construction”, Dhanpat Rai & Sons, New Delhi, 1994.2. Barry R., “Construction of Building”, Orient Longman lid, 1999.3. Chudley R., “Building Construction Handbook”, British library cataloguing, 2008.4. Francis DK Ching, “Building Construction Illustrated”, Van Nostrand Reinhold Ltd., 2001.5. Goyal, M.M , “Handbook of Building Construction”, Thomson Press.20046. Jha, J. & Sinha, S.K., “Building Construction”, Khanna Publishers, New Delhi, 1977.7. Kumar S.K., “Building Construction”, Standard publisher. 2003.8. Mckay, W.B, “Building Construction” - Vol. I, Longman, 2005.9. Mehta, M., Scarborough, W. and Armpriest, Diane, “Building Construction: Principles, Materials and Systems”, Pearson Prentic Hall, 2008.10. Punmia B.C., “Building Construction”, Laxmi Publications Pv1. Ltd., 1995.11. Rangwala S.C., “Building Construction”, Charotar Publishing House, 1963.12. Simmons H. L, “Olin’s Construction Principles, Materials and Methods”, John Wiley and Sons, 2007.
Pre-requisite:
Nil



SUBJECT NAME: CLIMATE RESPONSIVE ARCHITECTURE	SUBJECT CODE: ARL 153 (DC) L-T-P (Credits): 3-1-0 (4)	B. ARCH. SEMESTER: II
Objective:		
To study the fundamentals of climatology and its application in climate responsive building design.		
Course:		
<ul style="list-style-type: none"> • Climate & Weather. Scales of climate - macro-climate, meso-climate and micro climate. Climatic variables: temperature, humidity, precipitation, cooler radiation, wind, etc. Tropical Climate. Climatic Zones of India & their characteristics. • Geometry of solar movement. Altitude & azimuth angles. Sunpath diagram/Solar chart. Horizontal and vertical shadow angles. Use of shadow angle protractor. Design of shading devices. Performance evaluation of shading devices. • Air flow/wind movement around and through buildings. Natural ventilation. Climatic design recommendations for various climatic zones in India. • Thermal comfort. Indices of thermal comfort - Tropical Summer Index & Effective Temperature. • Thermal effects in buildings. Basic concepts of heat transfer in buildings, units & terminology. • The sky as a source of light, Daylight factor, Lighting - Windows, Room proportions and other building elements, Daylight penetration, Calculation of daylight factor. • Site Climate: Microclimate, site climate data, local factors, presence of water body and vegetation, topography, special characteristics, urban climate cooling degree days and heating degree days. • Passive Design Strategies, Orientation-sitting of building with respect to sun, wind and view, use of evaporative cooling, ground cooling-earth air tunnel, thermal mass-cavity wall, natural ventilation, night time cooling, reflective surfaces and radiant barrier, cool roof and green roof, etc. • Examples of contemporary climate responsive architecture India and Abroad. 		
Sessional work: Reports, Plates, Class tests, Case studies.		
Method of Assessment:		
Sessional Exam + Teacher's Assessment + End Term Exam		
Expected Outcome:		
References:		
<ol style="list-style-type: none"> 1. Crichfield Howard J., “General Climatology”, Phi Learning, 1998. 2. Ellis Aronin Jefferey, “Climate & Architecture”, Reinhold, 1953. 3. Evans Martin, “Housing, Climate and Comfort”, London: Architectural Press; New York: J. Wiley, 1980. 4. Givoni B., “Man Climate and Architecture”, Van Nostrad Reinhold, 1981. 5. Keonigsberge O.H., Ingersoll T. G., Mayhew Alan, Szokola S.V., “Manual of Tropical Housing and Building”, Orient Blackswan, 1984. 		



6. Kukreja C. P., “**Tropical Architecture**”, Tata Mc Graw-Hill, 1978.
7. Olgyay, Aladar, Olgyay Victor, “**Solar Control and shading Devices**”, Princeton University Press, 1957.
8. Sealey, Antony “**Introduction to building Climatology**”, C'wealth Assn.of Architects, September 1979.
9. Seshadri T. N., Sharma Mela Ram, Sharafat Ali “**Climatological and Solar Data for India**”, Central Building Research Institute, 1969.

Pre-requisite:

Nil

SUBJECT NAME: HISTORY OF ARCHITECTURE II	SUBJECT CODE: ARL 154 (DC) L-T-P (Credits): 3-0-0 (3)	B. ARCH. SEMESTER: II
Objective:		
Study the chronological evolution and impacts of geographic, climatic, geological, religious, political and socio-cultural backgrounds of western ancient and medieval architecture – in relationship to materials and techniques of construction.		
Course:		
Introduction to evolution of built form design as a result of socio cultural, physical, technological factors manifested in design attitudes during various phases in history. <ul style="list-style-type: none"> • Architecture of Ancient Civilizations: Egyptian –Mastabas, Royal Pyramids and Great Temples. West Asiatic (Mesopotamian and Persia) – Ziggurats and Palaces. Mayan Architecture – step Pyramid Complex • Classical Architecture: Greek – Columnar and Trabeated structural systems, Doric, Ionic and Corinthian Orders, Agora, Arcopolis, Temple of Parthenon, Cultural (theatre) and Sports (Public) Buildings, Optical correction. • Classical Architecture: Roman Arcuated Architecture, Monumental Scale, Tuscan and Composite Orders, Pantheon, Forum, Basilican, Thermae, Theatres (Colosseum) and circuses. • Medieval Architecture: Early Christian – Evolution of Church Architecture; Byzantine Architecture – Hagia Sophia; • Romanesque Architecture: Pisa Cathedral Complex, Gothic Architecture: Pointed Arch Architecture, Notre Dame etc. • Oriental Architecture: generic forms and transformation of styles in Japanese Architecture, Chinese Architecture. 		
Sessional work:		
Sessional examination and End term Examination, Assignments, Site Visit, Reports, Seminars and Documentation of historic structure, Sketches, Plates, and tests		
Method of Assessment:		

**Expected Outcome:****References:**

1. Bannister Fletcher, “**A History of Architecture**”, 20th edition, CBS Publishers and Distributors, New Delhi, 1999.
2. Christopher Tadgell, “**History of Architecture**”
3. Francis D.K.Ching, “**A Global History of Architecture**”, John Wiley and Sons., (Canada), 2011.
4. Henri Stierlin, “**Hindu India**”, From Khajuraho to the temple city of Madurai, Taschen, Paris, ISBN 3-8228-7649-6
5. Percy Brown, “**Indian Architecture (Buddhist and Hindu)**”, D. B. Taraporevala Sons and Co. Private Ltd., Bombay, India, 1995
6. Percy Brown, “**Indian Architecture (Islamic Period)**”, D. B. Taraporevala Sons and Co. Private Ltd., Bombay, India, 1995.
7. Satish Grover, “**History of Architecture**”.
8. Satish Chandra, “**History of Architecture & Ancient Building Materials in India**”.
9. Simon Unwin, “**Analysing Architecture**”, Roulledge, London, 2003.

Pre-requisite:

Nil

SUBJECT NAME: THEORY OF ARCHITECTURE	SUBJECT CODE: ARL 155 (DC) L-T-P (Credits): 3-0-0 (3)	B. ARCH. SEMESTER: II
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Objective:

The course aims at introducing basics of architecture and theory of architecture. The objectives of the course are to understand the evolution of the objective principles and subjective values that guide individual and collective decisions about, and assessments of one’s own and others’, architectural works.

Course:

- Introduction to Architecture- Definitions of Architecture – Origin of Architecture – architecture as a discipline – context for architecture as satisfying human needs: functional, aesthetic and psychological-outline of components and aspects of architectural form-site, structure, skin, materials, services, use, circulation, expression, character, experience – Introduction to the formal vocabulary of architecture and Gestalt ideas of visual perception. Debating a Discipline – Architecture, Argument, and the Concept of the Dialectic. “Simplicity and Complexity”, “Natural and Constructed”, “Context and Building”, “Gender, Race and the Body”, “Tangible and Intangible”.
- Elements of Architecture- Understanding fundamental elements such as point, line, plane, form and space, shape, pattern, light, colour, surface and texture with reference to the evolution of architectural form and space.



- Elements of Architecture – Form- Understanding perceptual effects of specific geometric forms such as sphere, cube, pyramid, cylinder and cone and its sections as well as their derivatives with respect to the evolution of architectural form and space.
- Elements of Architecture – Space- Understanding perceptual effects of specific configuration of architectural spaces – Enclosure – Internal and External, Continuous spaces – Spatial relationship and its types, Spatial organisation: Centralized, Linear, Radial Clustered, Grid – built form and open space relationships.
- Principles of Architecture- Understanding fundamental principles such as proportion, scale, balance, symmetry/asymmetry, rhythm, axis, hierarchy, datum, unity, harmony, dominance, climax – Movement with reference to the architectural form and space – detailed study of relationship between architectural form and circulation – Types of circulation – Building approach and entrance, path configuration and form, path space relationship, orientation.
- Theories in architecture verses theories in natural sciences or social sciences, three dichotomous pairs of theory of Architecture: “Objective principles and subjective values”, “Individual and collective”, “one’s own and others”. Theories of architectural technology: principles of structure, ventilation, drainage, lighting, etc. Theories of architectural history: social phenomena and patterns, linguistic analyses, analyses of physical artifacts, etc. Theories of architectural design: organizational strategies, design methods, spatial concepts, aesthetic judgments, etc.

Application of the above mention points in architecture, demonstrated through various architectural examples worldwide.

Sessional work: Sessional examination and End term Examination, Assignments.

Method of Assessment:

Sessional examination and End term Examination.

Expected Outcome:

References:

1. Charles Wallschlagger and Cynthia Busic-Snyder, “**Basic Visual Concepts and Principles for Artists, Architects and Designers**”, Mc Graw Hill, New York 1992.
2. Exner V., Pressel D., “**Basics Spatial Design**”, Birkhanser, 2009.
3. Francis D.K.Ching, “**Architecture: Form, Space and Order**”, Van Nostrand Reinhold Co., (Canaa), 1979.
4. John Ruskin, “**Seven lamps of Architecture**”.
5. Joshua C. Taylor, “**Learning to Look: A Handbook for the Visual Arts**”, (Phoenix Books), University Of Chicago Press, 1981
6. Korydon Smith., “**Introducing Architectural Theory**”, Debating a Discipline, Routledge, London, ISBN: 978-0-415-88837-0, 2012.
7. Michael Brawne, “**Architectural Thought: the Design Process and the Expectant Eye**”, Elsevier, London, ISBN 0 7506 58517, 2005
8. Mark Baskinger and William Bardel, “**Drawing Ideas: A Hand-Drawn Approach for Better Design**” Watson-Guptill, 2013.
9. Nikos Salingaros, “**A Theory of Architecture**”.
10. Nathan Knobler, “**Visual Dialogue**”, Harcourt School; 3 Sub edition, 1980.



11. Owen Cappelman and Michael Jack Jordon, “**Foundations in Architecture: An Annotated Anthology of Beginning Design Project**”, Van Nostrand Reinhold New York, 1993.
12. Pramari V.S., “**Design fundamentals in Architecture**”, Somaiya Publications Pvt. Ltd., New Nelhi, 1973.
13. Paul J. Zelanski and Mary Pat Fisher, “**The Art of Seeing**”, Pearson, 2010
14. Simon Unwin, “**Analysing Architecture**”, Roulledge, London, 2003.

Pre-requisite:

Nil

SUBJECT NAME: ENGINEERING MECHANICS	SUBJECT CODE: AML 169 (DC) L-T-P (Credits): 3-1-0 (4)	B. ARCH. SEMESTER: II
Objective:		
To introduce basic understanding requirement of structural aspect to engineering structures and to explain effect of forces on various structural elements such as beams, trusses, cables etc.		
Course:		
Co-planer Statics Analysis of static and basic concepts, law of forces, force system, Resolution and resultant of forces (concurrent parallel and non-concurrent), supports-types and reactions, free body diagram, equilibrium of forces, conditions of equilibrium. Cables Weightless flexible cables under concentrated loads and uniformly distributed load with level & non-level supports. Friction Laws of static friction, application to inclined planes and ladder. Properties of areas Centroid of areas, first and second moments of area about an axis in plane, parallel axis theorem, radius of gyration about an axis. Pin jointed trusses Solution by method of joints and method of section. Graphic Statics Force polygon and funicular polygon for coplanar forces. Condition of equilibrium, reactions at supports of simply supported beams and trusses, centroids of planer bodies, simple trusses – Maxwell diagrams.		
Method of Assessment:		
Expected Outcome:		
References:		
<ol style="list-style-type: none"> 1. R.C. Hibbler, “Engineering Mechanics”, Pearson Education, Asia Pvt. Ltd. 2. J.L. Meriam & L.G. Kraige, “Engineering Mechanics”, John Wiley and Sons. 3. F.P. Beer & E.R. Johnston, “Vector Mechanics for Engineers”, Tata McGraw Hill. 		
Pre-requisite		
Nil		



SUBJECT NAME: HEALTH INFORMATION AND SPORTS-PART-2	SUBJECT CODE: SAC 102 (DC) L-T-P (Credits): 0-0-2 (0)	B. ARCH. SEMESTER: II
Objective:		
Achieving higher level of physical activity in engineering population will contribute indirectly to gains in other sectors, vital to human development and economic progress. To improve productivity, foster social harmony, inculcate sense of discipline and dedication in general life, develop the spirit of team work, through various sports activities.		
Course:		
<ul style="list-style-type: none">• Physical Efficiency Test Level 2(Testing and Evaluation of Physical Fitness):1500 meter run, shuttle run, standing broad jump, one minute sit up test, flexibility test.• Testing and assessment of selected Physiological parameters through Sports Medicine Research Lab: Total body fat analysis, Harvard step test, BMI, WHR, Back strength, Leg strength, grip strength, resting pulse rate, and resting respiratory rate. Intramural phase 2: Badminton, Basketball, Cricket, Kho-Kho.		
Method of Assessment:		
Expected Outcome:		
References:		
Pre-requisite:		
Nil		



TIME TABLE

DEPARTMENT OF ARCHITECTURE & PLANNING, VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY, NAGPUR							
TIME TABLE for Odd Semester-1 (01 Dec, 2020 - 01 Mar, 2021)							
Separate Time Table would be proposed for Practical (02 - 13 Mar, 2021)							
Days/ Sem		1 09.00-09.55	2 10.00-10.55	3 11.00-11.55	4 12.00-12.55	13.00- 13.55	5 14.00-14.55
MON	Slots	C	D	E	F	MID DAY BREAK	H
	I	HUL179 COMM. SKILLS-English (Dept. of Humanities & Social Sciences)	ARL158 CONSTRUCTION - I, VSK	MAL 103 MATHEMATICS (Dept. of Mathematics)	ARP163 VISUAL ARTS, KNJ, AAP, AAP, AAP		ARP163 VISUAL ARTS, KNJ, AAP, AAP, AAP
TUE	Slots	D	E	F	H		C
	I	HUL179 COMM. SKILLS-English Tutorial (Dept. of Humanities & Social Sciences)	MAL 103 MATHEMATICS (Dept. of Mathematics)	ARL152 HISTORY OF ARCH. - I, AJW	ARL158 CONSTRUCTION STUDIO- I, VSK, AAP, AAP, AAP		ARL158 CONSTRUCTION STUDIO- I, VSK, AAP, AAP, AAP
WED	Slots	E	F	H	C		D
	I	MAL 103 MATHEMATICS (Dept. of Mathematics)	ARL152 HISTORY OF ARCH. - I, AJW	ARP 151 Building Material, VVG	ARP162 GRAPHICS - I, KNJ, AAP, AAP, AAP		ARP162 GRAPHICS - I, KNJ, AAP, AAP, AAP
THURS	Slots	F	H	C	D		E
	I	ARL152 HISTORY OF ARCH. - I, AJW	ARP 151 Building Material, VVG	HUL179 COMM. SKILLS-English Tutorial (Dept. of Humanities & Social Sciences)	ARP161 BASIC DESIGN, SHK, AJW, AAP, AAP	ARP161 BASIC DESIGN, SHK, AJW, AAP, AAP	
FRI	Slots	H	C	D	E	F	
	I	ARP 151 Building Material, VVG	HUL179 COMM. SKILLS-English (Dept. of Humanities & Social Sciences)	ARL158 CONSTRUCTION - I, VSK	MAL 103 MATHEMATICS Tutorial (Dept. of Mathematics)	ARL152 HISTORY OF ARCH. - I, AJW, AAP, AAP, AAP Tutorial	
SAT	Slots	F	H	C	D	E	
	I	ARP161 BASIC DESIGN, SHK, AJW, AAP, AAP					
DR. VIJAY KAPSE (VSK), DR. VINAYAK ADANE(VSA), DR. RAJASHREE KOTHARKAR(RSK),DR.VILAS BAKDE(VKB), DR. CHANDRA SABNANI(CSS), DR. AKSHAY PATIL(APP), DR. SMITHA KHAN(SHK), PROF. KISHOR , JOGLEKAR(KNJ),DR. SAMEER DESHKAR(SMD), Dr. AMIT WAHURWAGH(AJW), DR. VIDYA GHUGE(VVG), PROF. AMIT DESHMUKH(AMIT D.), Dr. SARIKA BAHADURE(SPB), Dr. PANKAJ BAHADURE(PNB), Dr. MINAL M SURAWAR (MMS), {Adjunct Assistant Professors (AAP)}							
Dr. Meenal Surawar Time Table Coordinator				Dr. V. S. Kapse Head of the Department			

