SCHEME OF EXAMINATION AND SYLLABI

for

Bachelor of Architecture (B. Arch.)

Offered by
University School of Architecture and Planning
and affiliated institutes

w.e.f. Academic Session 2018-19

Guru Gobind Singh Indraprastha University
Sector 16-C, New Delhi – 110078 [India]
www.ipu.ac.in
University School of Architecture and Planning (USAP)

The University School of Architecture and Planning (USAP) of the Guru Gobind Singh Indraprastha University (GGSIPU) was established in 2001, USAP has been conducting a five year B. Arch. Programme since then. In August 2009, USAP started B. Arch. Degree programme at the University campus. This is in addition to conducting the programme for affiliated institutes. The B. Arch. Programme of USAP is its core activity. The school is in the process of developing Post Graduate and Ph. D. Programme along with active consultancy and research.

Academic Programme

The USAP usually commences its academic programme in the month of August every year. The duration of the B. Arch. programme is 10 semesters i.e. 5 years.

The Academic semester shall devoted to 16 weeks of instruction/Teaching (including class test) work.

The Academic Calendar shall be notified by the University each year, before the start of academic year.

The maximum period required for completion of the programme shall be n+2 i.e. 7 years.

A student shall have to earn all the credits specified in the Scheme of Teaching & Examination and syllabi.

Structure of B. Arch. Programme

The broad objective of the programme is to impart theoretical and practical knowledge to students to prepare them for a professional career in the field of architecture. The course at a broad level aspires to widen the horizon of students with exposure of related scenarios in the field of architecture to determine the directions of their further development. The theoretical knowledge gained by students in class rooms and research mode is integrated in applied mode in Studio exercises.

The programme is designed by following guidelines of Council of Architecture for its B. Arch. degree. This forms the criteria for registration of students with COA as architect on completion of B. Arch. course of the school.

The courses are divided into four main modes for imparting theoretical, practical and interest based education to students.
### Core Courses

Core Courses represent the central learning of architectural education. Architecture is synthetic learning of various fields relating to humanities and scientific fields. Practical knowledge of the subjects is applied to projects which are resolved by students with faculty and these form the core of studios. Architectural Design, Building construction Arts and Drawing and communication along with other studio subjects are principally conducted in this way. Supplementary formal knowledge about technical aspects of building as well as abstract aspects of architectural thought draw upon other related disciplines of humanities are learned in a theoretical mode.

### Elective Courses

Electives shall be offered by the institute to supplement additional coursework or to advance knowledge in architecture and allied fields beyond core subjects. The Elective courses also reflect diverse technical and cultural developments of current relevance. These provide valuable specialized expertise or knowledge with the faculty of the institution or in the city. The courses will be seminar or practical/studio courses.

### Evaluation and Examination

The evaluation of students in a course shall have two components:

(i) Continuous evaluation by the teacher(s) of the course.

(ii) Evaluation through a Semester term end examination.

The guidelines for distribution of weightage for various components of evaluation shall be as below:

a. Theory Courses
   (i) Continuous evaluation by teacher(s) - 25%
   (ii) Semester term end examination - 75%

b. Practical / Studio Courses
   (i) Continuous evaluation by teacher(s) - 50%
   (ii) Semester term end examination - 50%
Conduct of Teacher’s Continuous Evaluation:
1. Theory Courses: The teacher’s continuous evaluations shall be based on the following:
   - One class test shall be of 20 marks
   - Assignment/ Group Discussion/ Viva Voce/ Additional Test/ Quizzes etc. Shall be of 5 marks
2. Practical / Studio Course
   The teacher’s continuous evaluation shall be based on performance in the course work through assignments of various nature including studies, exercises, presentations and reports etc. in the suitably spaced intervals.

Criteria for Passing Courses Marks

A student obtaining a minimum of 50% marks in aggregate in each Course including the Semester term end examination and Teacher’s Continuous Evaluation shall be essential for passing the subject and earning its assigned credits. A candidate, who secures less than 50% of marks in a Course, shall be deemed to have failed in that Course. Appearing in each component of examination (Teacher’s Continuous Evaluation as well as Semester term end examination) is mandatory to pass in a paper / course. Non appearance or being absent in any component shall mean that the student is fail in paper / course.

A student obtaining less than 50% of maximum marks (including Semester term end examination and Teacher’s Continuous Evaluation) assigned to a Course and failing in the Course shall be allowed to reappear in the next examination held, subject to maximum permissible period of (n+2) Academic year.

The re-appearing students who secured less than 50% marks in the Teacher’s Continuous Evaluation have the option to improve upon the class tests/assignments performances, in such cases the improved internal marks, if received from the School/Institution concerned, at least 5 days before the commencement of Re-Examination, shall be considered, otherwise the previous internal marks already obtained by the student shall be taken into account without any modification.

Students who are eligible to reappear in a semester examination shall have to apply to the Controller of Examinations through the School/ Institution concerned to be allowed to reappear in an examination and pay the fees prescribed by the University.

Promotion Policy to the Next Academic Year

Upon declaration of the results of the semesters of an academic year, a student failing in any course or courses aggregating more than 5 course credits shall not be eligible for promotion to the subsequent academic year.
A student who has failed in courses aggregating equal to or more than 6 credits shall be eligible to repeat the failed courses in the subsequent academic year. Such a student shall not be required to repeat any course that student has already completed successfully.

**Examination**

For the Studio / Practical examination of the courses, every student in each course shall be evaluated by 2 external examiners. The payment for each examiner shall be made as per the approved rates of the University.

Examinations for all theory courses shall be held at the end of semester. The question paper will be for maximum of 75 marks. The duration of examination shall be three hours for theory examination.

Ordinance 11 shall be applicable to the conduct of teaching and examination of this programme of study.
First Semester (Year - 1)

<table>
<thead>
<tr>
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<td>AP-107</td>
<td>Art and Architectural Graphics - I</td>
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<tr>
<td>AP-109</td>
<td>Workshop (NUES) – I</td>
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<td>AP-111</td>
<td>Surveying and Leveling (NUES)</td>
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<tr>
<td>AP-121</td>
<td>Theory of Structure – I</td>
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<td>AP-123</td>
<td>History of Architecture - I (Culture &amp; Vernacular)</td>
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<td>AP-125</td>
<td>Building Material Science – I</td>
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Note: Study tour/s up to 15 days duration will be conducted at least once in the first year. The educational task of the study tour will be assessed along with the studio work of Architectural Design.

Second Semester (Year - 1)

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<td>Art and Architectural Graphics - II</td>
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<td>Workshop (NUES)-II</td>
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<td>AP-122</td>
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<td>History of Architecture-II</td>
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<td>Building Material Science-II</td>
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<td>AP-128</td>
<td>Climatology</td>
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<td>Architecture and Writing</td>
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Third Semester (Year - 2)

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<td>Art Appreciation and Architectural Graphics - I</td>
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<td>Building Material Science – III</td>
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<td>Water Supply and Waste Management</td>
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Fourth Semester (Year - 2)

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<td>AP-208</td>
<td>Art Appreciation and Architectural Graphics - I</td>
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<td>AP-228</td>
<td>Lighting and Acoustics</td>
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<td>Psychology of Spatial Relationships</td>
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Note: Study tour/s up to 15 days duration will be conducted at least once in the Second year. The educational task of the study tour will be assessed along with the studio work of Architectural Design.
### Fifth Semester (Year - 3)

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<td>Building Construction – V</td>
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<td>AP-327</td>
<td>Energy and Fire Safety – I</td>
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<td>AP-329</td>
<td>Quantity and Estimation</td>
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<td>AP-341</td>
<td>Art &amp; Design Disciplines – I</td>
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<td>AP-343</td>
<td>Urban Issues – I</td>
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<td>AP-345</td>
<td>Advanced Construction Technologies- I</td>
<td>3</td>
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<tr>
<td>AP-347</td>
<td>Ecology &amp; Environmental Issues- I</td>
<td>3</td>
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<tr>
<td>AP-349</td>
<td>Landscape Architecture - I</td>
<td>3</td>
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<tr>
<td>AP-351</td>
<td>Visual Communication</td>
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<td>AP-353</td>
<td>Interior Design – I</td>
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### Sixth Semester (Year - 3)

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<td>Architectural Design - VI</td>
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<td>AP-304</td>
<td>Building Construction - VI (Working Drawing)</td>
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<td>AP-322</td>
<td>Theory of Structure - VI</td>
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<td>AP-324</td>
<td>Codes of Practice and Building Bye-laws</td>
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<td>AP-326</td>
<td>HVAC &amp; Security systems Access Control</td>
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<td>AP-328</td>
<td>Energy and Buildings - II</td>
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<td>AP-330</td>
<td>Specification and Contract Management</td>
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<td>AP-342</td>
<td>Art &amp; Design Disciplines - II</td>
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<td>Urban Issues - I</td>
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<td>Ecology &amp; Environmental Issues- II</td>
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<td>Landscape Architecture - II</td>
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<td>AP-352</td>
<td>Computer and Information Technology - I</td>
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<td>AP-354</td>
<td>Interior Design - II</td>
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Note: Study tour/s up to 15 days duration will be conducted at least once in the Third year. The educational task of the study tour will be assessed along with the studio work of Architectural Design.
Seventh Semester (Year - 4)

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<td>AP-401</td>
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<td>AP-403</td>
<td>Building Construction - VII</td>
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<td>AP-423</td>
<td>Town Planning-I</td>
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<td>AP-441</td>
<td>Humanities, History, Theory and Philosophy - I</td>
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<td>AP-443</td>
<td>Building Economics</td>
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<td>Advanced Construction Technologies- III</td>
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<td>Integrated Environmental Design</td>
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<td>Contemporary Processes in Architecture</td>
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<td>Computer and Information Technology - II</td>
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<td>AP-453</td>
<td>Advance Architectural Theories</td>
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<td>AP-455</td>
<td>Intelligent Buildings</td>
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Eighth Semesters (Year - 4)

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<td>AP-404</td>
<td>Building Construction - VIII</td>
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<td>AP-406</td>
<td>Dissertation / Research Paper</td>
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<td>AP-422</td>
<td>Town Planning-II</td>
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<td>AP-442</td>
<td>Humanities, History, Theory and Philosophy - II</td>
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<td>AP-444</td>
<td>Housing and Urban Development</td>
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<td>Earthquake Resistant Architecture</td>
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<td>Universal Access Enabled Environment</td>
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<td>Industrial Architecture</td>
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<td>AP-452</td>
<td>Advanced Computing</td>
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<td>Architectural Conservation</td>
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Note: Study tour/s up to 15 days duration may be conducted at least once in the fourth year. The educational task of the study tour will be assessed along with the studio work of Architectural Design.
Ninth Semester (Year - 5)

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<td>AP-501</td>
<td>Practical Training</td>
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* Practical Training should be 40 hours per week of 16 weeks

Tenth Semester (Year - 5)

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<td>AP-522</td>
<td>Professional Practice</td>
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<td>Total</td>
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</table>

Note:

1. Elective Course
   a) The elective courses offered in semesters, only one elective course has to be selected by each student per semester, subject to the time table.
   b) Minimum two elective courses to be offered by the institute
   c) The elective course shall be offered with a minimum 10 students per elective course

2. Total Number of credits in B. Arch. Programme = 300

3. Minimum Number of Credits to be earned for the award of B. Arch. Degree = 300
Bachelor of Architecture (B. Arch.) Syllabus

**General objectives for Design Studios:** Architectural Design is to be seen as a central discipline of the B. Arch. programme. The focus of this programme is to develop skills of design while engaging with pragmatic and speculative propositions about the making of the built environment. The studio is an arena where knowledge gained in the technologies, humanities and professional streams of the programme is synthesized into built environment solutions through the act of design with the exercise of the creative imagination of the designer.

The learning of Architectural Design is seen as a cumulative process with a spiral structure of development where it is used as a base for increasing the depth and breadth of knowledge and development of skills in the following year. The range of design exercises will therefore move progressively from exercises with a relatively limited scope and size of the individual component or small shelter toward the complexity and scale of city so that the student experiences the range of complexities that characterizes the Indian habitat.

The studio design exercises are intended to develop a student’s subjective abilities in the appreciation and creation of architectural form and the crafting of built objects, to consciously deploy processes and methodologies of design in response to varied design tasks and to develop a capability in deploying established and innovative design strategies. The iterative process of designing will also be used to develop verbal and graphic communication skills using a range of techniques and tools for representation such as hand drawn drawings, computer graphics and scale models, for presentation of design ideas and solutions.

Design exercises shall be devised by the course faculty acknowledging and building upon the cultural and intellectual assets of the student, opportunities offered by local environments, theoretical and philosophical issues thought to be relevant, and the knowledge gained by previous and parallel courses. The design work will be supplemented by research, discussion and lectures arranged during studio hours to assimilate a rich reference store of the culture of design. There may be several short and discreet exercises within an overall semester programme.

The design exercises and the studio programme for the semester, stating the learning outcomes and evaluation stages, shall be set well in advance in consultation with the course coordinator. The exercises may be designed in part requiring group work; however the intent shall be of developing and evaluating design capability for each individual student.

All other courses, while maintaining their individuality, shall contribute to Design.
Course Code : AP-101

Course Title : Architectural Design - I

Semester (Year) : First (Year -1 )

Contact Hours per week : L: 0  S: 6
                      per semester : L: 0  S: 96

No. of teaching weeks : 16

Credit : 6

Objective:
To learn principles of Space Form relationship in Architecture and to develop understanding of immediate context and to learn representation of ideas through sketches drawings, and three dimensional models.

Syllabus:

- Exercises to develop understanding of basic aspects of building form and space.
- Exercises to develop understanding of built objects and space in relation to the human scale
- Exercises to develop understanding of built objects and space in relation to elements of nature.
- Design exercises to explore for small single and multi-cellular constructs as a response to minimal programs, immediate surrounding and environmental settings.

Suggested Books/Readings:

2. Rudofsky, Bernard; Architecture without Architects, University of New Mexico Press, New Mexico
6. Gideon, Siegfried; Space, time & Architecture, Harvard University Press
Course Code : AP-103
Course Title : Building Construction - I
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 0  S: 5
                     per semester : L: 0  S: 80
No. of teaching weeks : 16
Credit : 5

Objectives:
Learning the process and techniques of masonry construction and to learn to communicate information through drawings and models.

Syllabus:

- Walls and piers with bonding techniques for block masonry including foundations, e.g. for brick masonry -English, Flemish bonds etc.
- Openings in masonry walls using spanning and load bearing techniques of corbelling, arches and lintels, domes.

Suggested Books/Readings:

Course Code : AP-105  
Course Title  : Architectural Drawing - I  
Semester (Year) : First (Year -1 )  
Contact Hours per week  : L: 0  S: 3  
                    per semester  : L: 0  S: 48  
No. of teaching weeks  : 16  
Credit  : 3  

Objectives:  
Learning drawings as a medium for expressing and representing ideas in architectural communication and developing visualization and conceptualization of objects through freehand sketches and drawings. Leaning importance of standard notations and practices in drawings,  

Syllabus:

Architectural Drawing:

- Introduction to drafting tools and their uses, freehand drawing and lettering in varying heights.
- Instrument based drawing appropriate to architectural applications. Construction of basic regular and irregular shapes and patterns in two dimensional geometry.
- Need, principles systems and methods of orthographic projection of lines, planes and solids.
- Development of surfaces of simple and hybrid solids.
- Sections of solids, Isometric, Axonometric views of various rectilinear and curvilinear 3-D objects.
- Introduction to architectural drawings-plans, elevations, sections, views, measured drawing of simple building components (simple furniture, sculpture, fountain, steps etc) and a small existing structure (kiosk, guard room Historical building or its part etc).

Suggested Books/Readings:

Course Code : AP-107
Course Title : Art and Architectural Graphic - I
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 0  S: 3
              per semester : L: 0  S: 48
No. of teaching weeks : 16
Credit : 3

Objectives:
Learning Art as a medium of expression of ideas and learning various techniques of representation.

Syllabus:
• Introduction to different lines and with pencils HB, B, 2B, 3B, 4B, 5B, 6B, charcoal pencil, etc.
• Rendering of different textures of building material in pencil
• Free hand still life sketching of composition of solids, cubes, cylinders etc. Study of light, shade and shadow.
• Free hand sketching in pencil of elements of scale like trees, shrubs, human, figures, vehicles etc.

Suggested Books/Readings:
<table>
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<tr>
<th>Course Code</th>
<th>AP-109</th>
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<tr>
<td>Course Title</td>
<td>Workshop (NUES) - I</td>
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<td>Semester (Year)</td>
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<tr>
<td>No. of teaching weeks</td>
<td>16</td>
</tr>
<tr>
<td>Credit</td>
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**Objectives:**

Imparting basic skills necessary for making Architectural solid 3D models of objects in various scales and understating of good craftsmanship.

**Syllabus:**

- Preparation of models using materials like paper, wood, plastic and others
- Making of models as per design in various scales
Course Code : AP-111
Course Title : Surveying and Leveling (NUES)
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 0  S: 2
       per semester : L: 0  S: 32
No. of teaching weeks : 16
Credit : 2

Objectives:
Familiarizing students with old and latest tools and equipments for land surveying. Interpretation and preparation of contour maps, setting out of building works and to undertake fieldworks.

Syllabus:

Introduction: Definition, classification, principles of surveying, Units of measurement, Scale, Signs convention, Surveying and Leveling Tools and equipment for land surveying
Chain Survey: Instruments used, Types of chain, Instruments for ranging, Setting out angles, Erecting perpendiculars, Selection of station, Methods of taking offset and Obstacles in chaining.
Plane Table Survey: Plane table and accessories, Methods of plane table survey, Radiation, Intersection, Traversing and resection
Compass Survey: The prismatic compass, Surveyor compass and its construction and uses, Reduced and whole circle bearing, Magnetic declination, Effect of local attraction.
Leveling & Contouring: Definition, Types of level, Booking and reduction of levels, Profile & cross section leveling, Errors in leveling. Characteristics of contours, Direct and indirect methods of contouring, Interpolation, Uses of contours, Calculation of area & volume.
Theodolite Survey: Study of instruments, Definition of different terms, Temporary adjustments, Uses, Measuring horizontal and vertical angles, Method of repetition, Extension of lines.
Total Station Familiarization
Interpretation and preparation of contour maps
Exercises in layout of buildings and checking the same at site.

Suggested Books/Readings:

1. Surveying and leveling (Vol. 1) by R.N. Arora; Standard Book House, Post Box No. 1074, Delhi -11006
Course Code : AP-121  
Course Title : Theory of Structures -I  
Semester (Year) : First (Year -1 )  
Contact Hours per week : L: 2  S: 0  
per semester : L: 32  S: 0  
No. of teaching weeks : 16  
Credit : 2  

Objectives:

To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

Syllabus:

Unit-1
Introduction to Statics: Forces, Law of parallelogram of forces, Law of triangle of forces, Polygon Law of forces, Resolution of forces, Resultant of number of concurrent coplanar forces, Condition of equilibrium, Moment of force, Moment and arm of couple, Theorems on couples.

Unit-2
Simple Stresses and Strains Elasticity, Stress, Strain, Types of stresses, Elastic limit, Hook’s law, Modulus of elasticity, Modulus of rigidity, Bulk modulus, Stresses in composite bars/section, Modular ratio, Equivalent area of a compound section. Primary or Linear strain, Poison’s ratio, Shear stress, Principal stresses and strains (for simple cases), Mohr’s circle.

Unit-3
Centre of Gravity & Moment of Inertia: Definition, Methods of finding out centre of gravity of simple figures, Centre of parallel forces. Definition, Important theorems, Calculation of moment of inertia of different shapes and its application, Moment of inertia of composite sections.

Unit-4
Shear Force and Bending Moments Beams shearing force and bending moment, Shear force and bending moment diagrams for cantilever and simply supported beam, and overhanging beam.

Stresses in Beams Simple beams bending, Section modulus, Moment of resistance, Shear stress in section of beam.
Explanation of above with simple models
Suggested Books/Readings:

5. Senol Utku, “Elementary Structural Analysis”.

Syllabus of B. Arch. Programme approved by Sub Committee of Academic Council on 8th August 2018 and Board of Studies of USAP on 7th August 2018 w.e.f. Academic session 2018-19
Course Code : AP-123
Course Title : History of Architecture –I (Culture & Vernacular)
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 2    S: 0
                   per semester : L: 32    S: 0
No. of teaching weeks : 16
Credit : 2

Objectives:
The course broadly focuses on architectural products of various times and places within a broad chronological band.
To inform about various determinants of culture and context of the place of study.
To understand the role of culture, beliefs, myths, politics, economics, geography, materials and climate etc. in shaping architectural intent of buildings.

Syllabus:
Unit-1
Ancient river valley civilizations
Egyptian: Geographical features of Nile Valley, development of cultural and religious beliefs-evolution of funerary architecture from Mastabas to Pyramids. Prominent case examples at Saqqara, Medun, Cheops and Giza, architecture of Mortuary & Cult Temples with case examples of Luxor, Ammon and Karnak, rock cut examples Abu Simbel etc.

Unit-2
Mesopotamian: Landscape and geographical description of fertile crescent, study of stages of civilization from early city states to Sumerian, Babylonian, Assyrian and Persian with prominent examples of Ziggurats at Ur, Urnamu etc.; Palaces and/or cities of Ur, Babylon, Khorsabad

Indus: factors contributing to the development of settlements along Indus Valley its extents and links with other civilizations of time, prominent features of civilization
Town Planning, residential and public buildings with case examples of cities of Mohenjodaro, Harappa, Lothal.

Unit-3
Classical Civilizations:
Unit-4
Greece - Early Iron Age Civilizations: Minoan, Mycenean and Classical Greek
Minoan and Mycenean: Palace at Knosos, the Lion Gate, the appearance of the Megaron.
Greek City states – Athens, Delphi, Sparta; Evolution of the Temple; the Orders; the Parthenon.

ROME - Structural and Engineering Achievements: the arch, Vault and the dome; Temples:
Pantheon; Arenas: Colloseum; Therma: Caracalla; Aqueducts; the forum and the basilica

Suggested Books/Readings:
1. Tadgel, Christopher History of Architecture in India Paperback – 6 Jul 1994
5. Shukla, D.N.; Vastu Shastra, Munshiram Mohanlal, New Delhi, 1993
6. Alexander, Christopher; A Pattern Language, Oxford University Press, New York, 1977
7. Lynch, Kevin; The Image of the City, Joint Centre Publication, USA, 1960
Course Code : AP-125
Course Title : Building Material Science - I
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 2  S: 0
 per semester : L: 32  S: 0
No. of teaching weeks : 16
Credit : 2
Objectives:

To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials
To sensitize the students to the use of these naturally occurring materials in the context of creating green architecture.

Syllabus

Unit-1
Introduction to basic building materials: Clay and Clay products: mud blocks, Earth stabilized blocks, Burnt Bricks, terracotta tiles, brick ballast and surkhi, flyash blocks, concrete blocks.

Unit-2
Stones: types of rocks, classification of stones, Indian stones, region wise, Building stones, their characteristics properties and usage. Slates

Unit-3
Lime its properties occurrence in nature, manufacture of lime, its usage in buildings. Mortars- its components, function and properties- mud, lime mortars
Concretes- in Lime - its components, mixing ratios and use in various parts of buildings

Unit-4
Bamboo and other natural materials: Bamboo as plant classification, species, geographical distribution, Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo.

Suggested Books/Readings:


22  Syllabus of B. Arch. Programme approved by
Sub Committee of Academic Council on 8th August 2018 and
Board of Studies of USAP on 7th August 2018
w.e.f. Academic session 2018-19
Course Code : AP-127
Course Title : Environmental Studies
Semester (Year) : First (Year -1 )
Contact Hours per week : L: 2 S: 0
                     per semester : L: 32 S: 0
No. of teaching weeks : 16
Credit : 2

Objectives:
Ecology and ecosystems- elemental what constitutes the environment,
Environment and its degradation- issues their causes and alleviation understand what are precious resources in the environment, how to conserve these resources,
Application of environmental planning in architecture
The role of an architect in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity.

Syllabus:

Unit-1
Description of concept of environment and ecology-need for public awareness Interaction among ecological factors as related to water, land, air light and temperature.
Factors Responsible for Change-Global Warming and climate change-loss of bio diversity, deforestation and desertification

Unit-2
Ecosystem: Its Structure, Function and energy cycles in ecosystem.
Ecological succession, Ecosystem development, Climax concept
Interrelation between natural and built environment in urban and rural settlements Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people
Land and soils: formation of soils, its types, basic features and properties as related to built environment.
Water and precipitation: sources of water and their degradation, water cycle, Prevention and control of water pollution,- Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems Conservation & management, impact of manmade environment on water.
Unit-3
Air and air pollution: its causes and impact on human settlements.
Control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution
(e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: disaster
management: floods, earthquake, cyclone and landslides. Environment protection act – Air
(Prevention and Control of Pollution) act – Water (Prevention and control of Pollution) act –
Wildlife protection act – Forest conservation act.

Unit-4
From unsustainable to sustainable development – urban problems related to energy.
Water conservation, rain water harvesting, and watershed management. Resettlement and
Rehabilitation of people; its problems and concerns

Suggested Books/Readings:

1. Baructa E, 2004, textbook of environments courses of UG, courses, UGC University Press,
3. Perlman, D. and Miclder, J., “Practical Ecology for Planners Developers and Citizens”, Island
   Press.
   Academy of Sciences.
5. Gilbert M. Masters, “Introduction to Environmental Engineering and Science”, 2nd
6. Aruba Kashia and Kashia C.P., “Perspectives in Environmental Studies” New age
   International (P) Ltd., New Delhi, 2005.
   of India Pvt. Ltd., New Delhi, 2006.
9. Dharmendra S. Sengar, “Environmental law”, Prentice hall of India PVT LTD, New Delhi,
   2007
10. Rajagopalan, R, “Environmental Studies-From Crisis to Cure”, Oxford University Press,
    2005
11. Richard T. Wright, “Environmental Science” Prentice Hall of India Pvt. Ltd., New Delhi,
    2007
SYLLABUS- SECOND SEMESTER
(in continuation with approved scheme of examination and syllabus of semester- 1)

for

Bachelor of Architecture (B. Arch.)

Offered by
University School of Architecture and Planning and affiliated institutes

w.e.f. Academic Session 2018-19

Guru Gobind Singh Indraprastha University Sector 16-C, New Delhi – 110078 [India]

www.ipu.ac.in
Course Code : AP-102
Course Title : Architectural Design - II
Semester (Year) : Second (Year -1 )
Contact Hours per week : L: 0  S: 6
per semester : L: 0  S: 96
No. of teaching weeks : 16
Credit : 6

Objective:
To learn designing Small building addressing all fundamental factors at an elementary level.

Syllabus:
One Single/ Double Family House or equivalent

Exercises’ before beginning of Design (To be Taught )

- Making of Functional Programming from requirements of human domestic activities.
  Space Allocation according to Program (2Weeks)
- Form options, Use of simple Material order and building components. (e.g.Door Window Etc, Structural Options. Basic Building services (2Weeks)

Design Exercise

- Design Problem (10 Weeks)
  Conceptualisation and Design Development

Suggested Books/Readings:

2. Rudofsky, Bernard; Architecture without Architects, University of New Mexico Press, New Mexico
6. Gideon, Siegfried; Space, time & Architecture, Harvard University Press
Course Code : AP-104
Course Title : Building Construction - II
Semester (Year) : Second (Year -1 )
Contact Hours per week : L: 0    S: 5
                      per semester  : L: 0    S: 80
No. of teaching weeks : 16
Credit : 5

Objectives:
Learning Construction of a double storey Masonry Building with more than one habitable spaces.

Syllabus:
- Brick Work in Super structure
- RCC/RB Roofing and Terracing of the designed space using conventional techniques of construction.
  Detailed sections: Built over brick work in superstructure.
- Simple Straight flight staircase in masonry connecting two levels.
  Detail drawings
- Flooring Details
- Wooden Door and Window Design and Joinery Details

Suggested Books/Readings:
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<tr>
<td>Course Title</td>
<td>:</td>
<td>Architectural Drawing - II</td>
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<tr>
<td>Semester (Year)</td>
<td>:</td>
<td>Second (Year -1 )</td>
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<tr>
<td>Contact Hours per week</td>
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**Objectives:**
- To equip students in 3D visualization by drawings
- To develop presentation skills by rendering and graphic representation
- To introduce computer aided drafting tools

**Syllabus:**

**Architectural Drawing:**

Introduction to basic terminologies and types of perspective drawing. One point and two point perspective drawings.

Sciography in plan, elevations and 3-D view.

Introduction to CAD (Basic commands) setting up drawing environment. (Drawing simple structures/shapes in 2D)

Learning basic 2D commands their function and application. Lines, line types, scale, text, hatching etc. Working on layers and colors.

**Suggested Books/Readings:**

Course Code : AP-108
Course Title : Art and Architectural Graphics - II
Semester (Year) : Second (Year -1 )
Contact Hours per week : L: 0  S: 3
         per semester : L: 0  S: 48
No. of teaching weeks : 16
Credit : 3

Objectives:
To develop techniques of expression of Ideas related to Architecture - Form Space Environment People.

Syllabus:

• Outdoor sketching, sketches of buildings to understand scale and proportion, rhythm, harmony. Light and shadows in building elements, buildings and surroundings.
• Demonstration of use of various presentation mediums and techniques
• Posters Collages Murals
• Expression of ideas with diagrams and ideograms

Different modes of rendering for architectural presentation Rendering techniques with different textures, tones and colors

Suggested Books/Readings:
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<td><strong>Course Title</strong></td>
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<td><strong>Credit</strong></td>
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**Objectives:**

To know to use traditional tools and to have hands on experience with materials and construction.

**Syllabus:**

- Introduction to carpentry tools, safety rules and precautions.
- Demonstration in basic carpentry various types of joints in wood, boards, MDF etc.
- Difference in joining wood by nailing and screws.
- Sheet metal work, fabrication, welding and foundry
Course Code : AP-122
Course Title : Theory of Structures -II
Semester (Year) : Second (Year -1 )
Contact Hours per week : L: 2  S: 0
                   per semester : L: 32  S: 0
No. of teaching weeks : 16
Credit : 2

Objectives:
To understand the basic principles and applications of structural design with Masonry and Timber.

Syllabus:

Unit-1
Masonry Structures: Introduction: Characteristics of load bearing masonry structures, their merits, scope and limitations, Classification of bricks and mortars according to strength. Allowable stresses in masonry; effects of slenderness ratio, area and shape factors on allowable stresses.
Masonry Arches, Masonry Vaults & Masonry Domes: Conceptual study as compression structures. (Without design calculations)

Unit-2
Design of Simple two storied House in load bearing masonry construction: Load calculations on slabs, transfer of load from slabs to load bearing masonry supporting walls. Design of load bearing masonry walls. Design of simple spread footings for load bearing masonry walls

Unit-3
Stresses in Trusses: Introduction, Perfect frame, Deficient frame, Redundant frame, Type of supports and their reactions, Analysis of cantilever and simply supported trusses by Analytical method, Method of sections, Graphical method.

Unit-4
Timber Structures: Structural timbers available in India, Structural properties and their allowable stresses, Design of timber Beams. (Simple M/Z application and shear check for forces along the grains (no slopes) Design of timber posts & trusses for simple cases. (No mathematical analysis for timber trusses).
Explanation of above with simple models
Suggested Books/Readings:

4. Senol Utku, “Elementary Structural Analysis”.

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Syllabus of B. Arch. Programme approved by
Sub Committee of Academic Council on 8th August 2018 and
Board of Studies of USAP on 7th August 2018
w.e.f. Academic session 2018-19
Course Code : AP-124
Course Title : History of Architecture –II
Semester (Year) : Second (Year -1 )
Contact Hours per week : L: 2  S: 0
                     per semester : L: 32  S: 0
No. of teaching weeks : 16
Credit : 2

Objectives:

To understand various building typologies and landscape emerging out of different ideologies and Cultural practices in historical periods in India. To understand, primarily, the Essential, Conceptual Typological similarities in spite of stylistic variations.

Syllabus:

Unit-: Budhdhist
Architecture of Buddhist origin
Stupas Chaityas and Caves Viharas Monasteries
Focus:Sanchi Karli Ajanta Ellora Saarnath Bodhgaya,
Others brief Ref.

Unit-2: Hindu Temple Architecture
Shrines Temples Complexes
North & East India Focus Guptas Orissa Khajuraho
Pilgrimage Centres Ghats and Palaces Focus Varanasi
South Indian Focus: Chalukyas, Cholas and Chalukyas Vjaynagar Madurai

Unit-3: Islamic Architecture in India
Mosque Madrasaus Tomb Garden Fort Palace
North India Khaljis, Tughlaqs, Lodhis
Early Mughal Sher Shah
South India Golcunda Bijapur etc.

Unit-4 :
Mughal Architecture
Akbar, Shahjahahn
Jaipur Lucknow Focus: Forts Palace Religious Institutions
Traditional Courtyard Typology

Suggested Books/Readings:

1.  Tadgel, Christopher History of Architecture in India Paperback – 6 Jul 1994
4.  Shukla, D.N.; Vastu Shastra, Munshiram Mohanlal, New Delhi, 1993
Course Code : AP-126
Course Title : Building Material Science - II
Semester (Year) : Second(Year -1 )
Contact Hours per week : L: 2  S: 0
per semester : L: 32  S: 0
No. of teaching weeks : 16
Credit : 2

Objectives:
To have an understanding of the properties, characteristics, strength, manufacture, processing and application of materials.
To sensitize the students to the use of these naturally occurring materials in the context of creating a green architecture

Syllabus:

Unit-1
Timber & Hardware
Classification, Characteristics, Defects, seasoning, Preservation, market forms of timber, conversion of timber typical timber species in India
Door Window Hardware-Hinges, Handles, Knobs, Bolts, L-drops, Locks, Stoppers, Stays, Silencers, Chain guards, Closers, Catchers, Knockers etc. in various materials.

Unit-2
Ply woods, fiber boards, Veneers, Lamin Boards, Batten Boards

Unit-3
Paints for woodwork - Classification, Constituents, Characteristics of good paints, covering power,
Preparation, Application of paints for various surfaces, Defects in painting,
Polishing and varnishes for wood work varnishes-ingredients, Process of varnishing woodwork

Unit-4
Glass- its manufacture, properties, and types-sheet glass, float glass, tinted and colored patterned glass,
tempered glass (heat and shock resistant glass), heat reflecting glasse, multi layered glass, laminated glass,
wired glass, use of films on glass, Glass blocks, glass tiles, mirrors, and Glass wool.
Suggested Books/Readings:

Objective:

To acquaint the students with underlying parameters of Human Comfort in relation to built environment
To apprise students of climate and its impact on buildings
To equip the students with strategies and techniques to regulate the impact of climatic factors in buildings

Syllabus:

Unit-1: Introduction to Climate and Climatology
Climate and Architecture, Elements of climate - solar radiation, temperature, wind, humidity & precipitation and their measurement, Climate types:
Global Climatic Zones, Tropical climate, climatic zones of India, Macro and Micro Climate,
Development of traditional/vernacular architecture in response to climate

Unit-2: Heat
Effective Temperature and isopleths, CET, Adaptive comfort, operative temperature

Building heat exchange: Sol Air Temperature, Solar Gain Factor, methods of heat exchange in buildings,
Thermal Quantities: Temperature, Heat, Heat Flow Rate Specific Heat, Conductance, Resistance,
Surface Conductance, U value, Periodic Heat Flow, Time Lag & decrement factor, Effect of Different Materials, Effect of Multilayered Bodies - Insulation/Cavity. To interpret climatic data for design to determine potential strategies for achieving thermal comfort by design of building envelope:

Unit-3: Light
Sun path diagrams: concept and interpretation, Understanding the solar position of a place, azimuth, altitude, solar incidence, using shadow angle protractor for designing shading devices.
Daylight: Natural light, day light factor, concept of glare and glare index, determination of daylight factor using graphical techniques. Principles of day lighting in buildings

Unit-4: Air
Ventilation and air movement: wind chart, wind rose, Assessment of natural ventilation, Movement of air in and around buildings, WWR, Sizing and positioning of opening in buildings, Stack effect.

Building orientation and its impact on admission/exclusion of sun, air and daylight in buildings
Suggested Books/Readings:

4. Givoni B, Mariclimate & Architecture
**Course Code**: AP-130  
**Course Title**: Architecture and Writing  
**Semester (Year)**: Second (Year -1 )  
**Contact Hours** per week:  
- L: 2  
- S: 0  
**per semester**:  
- L: 32  
- S: 0  
**No. of teaching weeks**: 16  
**Credit**: 2

**Objectives:**  
Learning about writing as an important aspect in architectural academics and practice. Develop skill of writing for architectural purpose.

**Syllabus:**

**Unit-1: Basic Concepts and objectives of writing**  
- Procedure – to tell how something is done  
- Description – to tell what something is like  
- Report- to tell what a class of things is like  
- Explanation – to give reason to why a judgment is made

Descriptive and Analytical writing in architecture

**Unit-2: Communication**  
Writing as a medium of representation of Ideas, independently, and along with other media like drawing sketching and photography.  
Technical communication, Professional and Business Communication

**Unit-3: Journalism**  
Understanding the scope of writing for diverse audience or readers.  
For printed for theoretical Journals and commercial magazines, news items and event coverage like Exhibitions, Seminars.  
Project description, Reviews. Web Content development for web based publications.

**Unit-4: Knowledge**  
Documentation of works of Architects, Organisations and Architecture, Biographies.  
Critical Appraisals, Book Reviews. Project reviews.  
Writing of History and Theoretical studies  
Publication, Concept of Authorship Plagiarism Copyright.
Suggested Books/Readings:

4. Journals of Landscape, Brijender S. Dua, C-589, Vikas Puri